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For and Against the Transport Bill

IN a speech last Saturday Mr. Churchill described the Transport Bill, to be introduced in November, as a measure designed to "restore vitality to our road transport system as well as improve and strengthen the working of our national railways." He argued that the rapid increase in the number of "C" licences showed that the State-owned vehicles were failing to attract users, and suggested that the cheaper rates it was hoped to see offered by denationalised road transport might halt if not reduce this increase, which he regarded as wasteful of effort and materials. On the position of the railways in relation to the roads under the new Bill, Mr. Churchill said that one part of the proposed measure would "liberate the railways from some of the ancient statutory fetters which prevent them from competing as they would wish with road transport." This at least acknowledged the principle that competition must be on equal terms, but misgivings have naturally been created by the secondary position occupied by the railways in the text of the Bill itself and in statements about it so far. There is much scepticism as to the practicability of using the proposed levy on road hauliers to compensate the railways for traffic lost to the roads, and the fact that so unusual a device has been introduced suggests that the powers given under the Bill to raise railway charges by up to 10 per cent. without application to the Transport Tribunal in order to meet increased costs, are not thought to go far towards establishing competition with equal chances for both sides. A more radical attack on "ancient statutory fetters" will be required to prevent the roads taking the cream of the traffic even though the railways are physically and technically equipped to handle it to the full satisfaction of the trader. Speeches in the Opposition's campaign against the Bill, launched on the day Mr. Churchill spoke, have also concentrated so far on the proposed sale of vehicles to private operators, and the consequences to the purchasers in the event of a Socialist Government being returned at a future election. Meetings are being asked to support a resolution describing the Bill as "a petty measure" and calling on the Government to withdraw it in the national interest. The Bill is criticised for putting an end to transport integration, and waverers with memories of the old railway companies who feel some interest in its proposals for decentralised railway management have had the best part of a page of *The Railway Review* devoted to pointing out their doctrinal error.

Sir Bruce Thomas

THE death, after less than two years' retirement, of Sir Bruce Thomas, Q.C., President of the Railway Rates Tribunal from 1932 to 1948, and afterwards President of the Transport Tribunal, will be felt keenly by the many railway officers who came into contact with him in the course of his term of office. After early experience as a solicitor he was called by the Middle Temple in 1911 and soon established a large practice, which he left in 1932 to take up his position with the Railway Rates Tribunal. Between 1918-32 he had been prominently engaged in the inquiries before the Rates Advisory Committee and in the involved and lengthy litigation before the Railway Rates Tribunal, the Court of Appeal and the House of Lords, arising out of the railway charges provisions of the Railways Act, 1921, so gaining an unrivalled knowledge of the law and history of carriage by rail. One of his major tasks came in 1950, at the age of 72, when he became Chairman of the public inquiry into the B.T.C. London fares scheme. At a meeting of the Transport Tribunal, before his retirement, several fitting tributes were paid to his life's work. Lord Hurcomb, Chairman of the B.T.C., said he had been concerned in Sir Bruce Thomas's appointment. It was a fact that all the trading bodies, although Sir Bruce Thomas had been a most formidable apponent of theirs for the railway companies up to the moment of his appointment, were unanimous in saying that there was no appointment which could be so acceptable as that of Sir Bruce; that had been a very great tribute.

Indian Railways 1953 Exhibition

THE decision by the Government of India to mark the Indian railway centenary next year by holding an exhibition in New Delhi will be of considerable interest to British manufacturers of railway equipment. The exhibition, which is expected to be held on a 60-acre site between February 28 and April 16, is being planned to show a century of progress on the Indian railways; the variety of services provided, by featuring types of rolling stock that have been in use; the importance of the railways to Indian economy; and how Indian railways compare with others elsewhere in the world. A display of the products of those countries which have, and are, contributing to the growth of Indian railways is to be included and it is intended to make advancements in production methods and the development of alternative forms of traction a special feature. Permits for the import of exhibits will be granted, though exhibits are to be re-exported within a specified period unless disposal in India is specially authorised. The exhibition site is to be connected to the main line and track of any gauge required for exhibits will be supplied.

D

A Fruitful International Conference

RAILWAYMEN of different countries not only in Europe but in other continents are bound to differ profoundly on controversial topics. It was not to be expected, therefore, that the agreed conclusions of the Enlarged Meeting of the Permanent Commission of the International Railway Congress Association held in Stockholm this summer, could illustrate the range and depth of the discussions leading to those conclusions. The latter are summarised elsewhere in this issue. It is precisely because the recommendations of I.R.C.A. meetings are not binding on member railway administrations or Governments that the discussions, which are, in the best sense of the word, academic, are of such value. Nor can a necessarily abridged list of those present do more than hint at the strength of delegations, of which the British, for instance, included, besides the officials named, a wide variety of experience and talent in its less senior members. The presence of delegates of the Indian, New Zealand, and South African Governments shows the geographical scope and prestige of the Association. A particularly pleasing feature of the conference was the generous Swedish hospitality and the efficiency with which the Swedish State Railways, the host administration, made the local arrangements for the meetings and functions and for the wide variety of technical visits and excursions.

Nationalised Industries

MR. ERNEST DAVIES, M.P., author of a Labour Party discussion pamphlet, "Problems of Public Ownership," in expressing some disappointment at the results of nationalisation, draws attention to trades union rivalry as "a drag on road and rail integration, which was only approaching solution after four years of operation of the Transport Act." Though Mr. Davies overestimates the progress made in the co-ordination of transport, he rightly points out the unions' opposition to it, notably in frustrating the efforts made by the Railway and Road Haulage Executives in connection with long-distance freight. He admits that compensation of railway stockholders cannot be repudiated. Subsidies, he considers, need not cause waste or inefficiency if granted for a fixed period or for a specific purpose, in support of which he quotes the subsidies to the British airways corporations—though he does not state how different are the circumstances in which the airways function, nor the purpose of the airway subsidies in the development of aviation. Mr. Davies stresses the dangers of interference for political reasons in the working of nationalised undertakings, and deprecates Parliamentary questions on day-to-day administration. His principal suggestion is appointment of a Minister for Nationalised Industries, with a seat in the Cabinet, to co-ordinate policy. In view of the multiplicity of existing controls over nationalised industries at Government level and below—there are three layers between the Cabinet and the Railway Executive—it is hard to see what purpose would be served by yet another Minister.

Track Inspection Vehicles

AT present British Railways carry out permanent way inspections with the Hallade instrument installed in ordinary rolling stock. Certain limitations are imposed on this system of making records by the characteristics of the vehicles used, and therefore the possibilities of inspections with cars designed specially for this purpose are being actively studied. The special vehicle itself may have its limitations in some respects, but seems likely to provide a useful standard of known characteristics. Three types are under consideration, one of which, the Mauzin track inspection car, is described elsewhere in this issue. Mauzin cars built by the French National Railways have covered long intineraries in France, Belgium, Holland, Austria, Denmark, and Sweden. Study of their records has been found to promote economies by enabling work to be concentrated on sections of line most in need of it, and comparisons between charts have provided useful data regarding the effectiveness of various items of permanent way equipment. In addition they enable credit to be given to staff where it is due and detect any consistent shortcomings in workmanship or supervision. The influence of permanent way maintenance on the standards of speed permissible has been stressed on many occasions. In present conditions of labour costs and materials supply, all methods of enabling available resources to be used most fruitfully are of particular interest.

Theory of Signal Circuit Design

THE art of designing electric circuits to meet a given set of conditions in the most effective manner, both from the point of safety and of making the best possible use of the component apparatus and wires, local and line, has attracted attention for many years, and has been the subject of much writing and discussion, in this country and abroad. In recent issues of *Signal und Draht* Dr. Wilhelm Schmitz, well known in Germany as a signalling historian, discusses proposals of this nature, going as far back as 1896, when Boda in Prague began to write about it from the railway signalling standpoint and developed his own methods in connection with the Siemens type block apparatus, widely used in Central Europe. Others followed suit, perhaps the best known being Edler in Vienna, and Dr. Schmitz passes the various suggestions in review, including instances of "circuit algebra." Although his actual examples refer to block equipment never seen in Great Britain, Dr. Schmitz's informative study is of considerable interest to anyone concerned with the problem of laying out rapidly efficient designs of signalling circuits and presenting them in diagram form.

Heating-Superheating Surface

ON the descriptive card of the celebrated old North Eastern 4-4-0 No. 1621 in York Railway Museum we read recently "Heating surface including Schmidt superheater 1,097 sq. ft." and so the error once again came before our eyes. At the time when superheating came into vogue here, heating surface, however it was obtained, was still regarded as a measure of power and success. The installation of a superheater brought the heating surface down; and that was more than some mechanical engineers could bear—at least in regard to their own engines. So the less astute and the more astute soon hit on the means of combining evaporative and superheating surface and giving it as one total. It looked more. Indeed, in years gone by we have occasionally been guilty of the practice ourselves. But one might as well write "Wheelbase including rail gauge" for all the sense it makes. Evaporative surface is quite different from superheating surface, and the best way to separate them is, perhaps, to give tube and flue surface, firebox surface, total evaporative surface, grate area, and superheating surface in that sequence.

Locomotive Boiler Design

THE many problems with which the locomotive designer is faced in producing a boiler having good steaming qualities form the subject of an illustrated article elsewhere in this issue. It is suggested that the earlier designers of power producing plant used the trial and error method due to the absence of reliable data. Even so such methods had their uses, in that much of the work carried out by early designers contains information of considerable value. From the locomotive boiler efficiency point of view it is suggested that the lack of balance in the relation of firebox heating surface to the grate area seriously affects the steaming qualities of the boiler, and that the firebox surface, including thermic syphons and arch tubes is most valuable in its steam generating function. Also it is considered essential to provide, preferably more than five sq. ft. of firebox heating surface to each sq. ft. of grate area. Other aspects of design dealt with include flues, tubes, and superheater elements.

Railways for Recreation

THERE is no sign yet of another industry making as strong, widespread, and lasting an appeal to the general public as the railway. The appetite for railway literature manifested itself early and has continued ever since. Railroadiana, an exhibition opened at 7, Albemarle Street, London, W.1, on September 10, under the auspices of the National Book League, shows how it has been catered for over more than a hundred years in books, plays, pictures, and occasional verse. Official railway publications, guides, and timetables, many of great historical interest, are included, but for the most part the literature is designed for the leisure hour, whether in the nursery or the study. A railway race game of about 1840 may be the first of a long family founded by an opportune adaptation of snakes and ladders. Ballad mongers are shown to have profited from early openings and even accidents, and there is a quadrille "respectfully dedicated to the Chairman and Directors of the East Anglian Railways." Also on view is the Kinora, an improved version of the Zoëtrope, which showed railway scenes in motion in the drawing room on the principle still applied to less worthy subjects on our seaside piers.

Final Report on Productivity

THIS week the Anglo-American Council on Productivity has issued its final report,* reviewing its work and methods and the impact ascertainable so far of its teams' recommendations on various industries. It is not yet possible to produce figures showing improvement in production per man-hour directly attributable to the reports on methods in the U.S.A., but the council believes that there will come into being in this country an improved climate of opinion about productivity. Members of its teams, totalling 911 individuals, are stated to have found a different attitude of mind in the U.S.A. from that prevailing in many quarters of the United Kingdom. Through their various social and industrial contacts at home, they are thought to be spreading over widening circles a new attitude to the importance of increasing productivity. Such a change of outlook is seen to be a gradual process in which only the first steps have been taken so far. The work now so well under way will be continued, it is announced, by the establishment of a British Productivity Council, and it is proposed that this council should hold a national conference later in the year.

Two of the subjects selected as representative of the impact of the reports on industry are diesel locomotive manufacture and materials handling. The principal recommendations which are reported to have impressed the diesel locomotive industry are those on unit construction and welding. It is recorded that the industry is rapidly extending unit construction of gearboxes, frames, superstructures, auxiliary assemblies, cabs, and wheels. Some companies making small locomotives have reduced erection time to a matter of a few hours by thorough unit construction. It is acknowledged that unit construction has to some extent always been the practice of the industry because the engine and, when used, electrical transmission equipment are almost always obtained from outside, but the council is satisfied that the practice is now being followed on a greatly increased scale.

Welding is saving time in diesel locomotive manufacture just as unit construction has done in erection. The welding of the major part of the frame, superstructure, and cab is now not uncommon. Methods of welding are being studied, and several firms are reported to be using various types of small and large manipulators by means of which the job to be welded can be moved into a convenient position for the welder. The report also mentions that some companies are changing their designs so that full advantage can be taken of new procedures in unit construction and welding.

Perhaps the report with the most widespread effect on industry has been that on materials handling. There has been similar interest in the freight handling report, and acknowledgment is given to the extended use of pallets by British Railways. The final report maintains that throughout industry and the transport services there is already a greater consciousness of the waste that arises from poor methods of handling.

It would have been interesting if the final report had been more specific about the ways in which the attitude of mind towards productivity in some quarters in the United Kingdom differs from that in the U.S.A., and had said which these quarters are. There was a sharp reminder that differences exist only last week, when the President of the Eastern Air Lines of the United States expressed doubts after visiting this country as to whether Great Britain would maintain the lead she had established in commercial jet aircraft, and said that if he was in charge of production of the "Comet" he would work "Sundays, holidays, and every day and night." Two days later Professor Ernst Heinkel, the German aircraft designer, referred at the end of his visit here to "a certain lack of energy and production capacity." Visitors from abroad are liable to be misled in assessing our zeal and determination by the traditional British habit of understatement, but the final report on productivity hints at the existence of a prejudice against new methods, if not of inertia. The process of eradicating it by the precept and example of 911 ex-members of productivity teams may be too slow for present circumstances.

* Published by the Anglo-American Council on Productivity, U.K. Section, 21, Tothill Street, London, S.W.1. Price 3s. 6d. post free

Machine Tool Exhibition

THE seventh Machine Tool Exhibition organised by the Machine Tool Trades Association will open at Olympia on Wednesday, September 17, and will remain open until October 4. Taken as a whole the exhibition, which will be international, will represent the most comprehensive display of machine tools and ancillary equipment to be staged in this country. A list of the firms exhibiting is given elsewhere this week. Machine tools play an important part in the economic life of the nation, as well as in our export programme, as is shown by the fact that during 1951 the value of British machine tools was £48 million, of which some £16 million were exported.

Machine tools produced in this country during 1948, the year in which the last M.T.T.A. exhibition was held, were worth approximately £30 million, and a comparison of the figures with 1951 is an indication of the growth of world demand. The industry has always maintained a high export level, and for some years about 33 per cent. of British machine tool production by value was sent overseas. There remains, also, the urgency of home needs, and without the latest types of machines designed to keep production costs to a minimum, prices of manufactured goods destined for export cannot be brought down to the level which overseas buyers appear to expect.

The locomotive manufacturing industry and railway mechanical engineers have derived considerable benefit from the advance in technique made by machine tool manufacturers, who have shown that they are well able to cope with the often exacting demands of the modern railway workshop. The progress in machine tool design, together with the improved technique in handling materials by mechanical means, has brought about considerable economies in manpower and has expedited output to a remarkable degree. There is always room, however, for further technical progress, and since machine tools and equipment used in railway workshops are mainly those applicable to the engineering industry as a whole, railwaymen visiting Olympia will find that, apart from such developments as might be expected since the last exhibition in 1948, various prototype machines of revolutionary design have made their appearance.

Most of the machines on exhibition, many of which will be shown under actual production conditions, were made in this country, but something approaching 20 per cent. of the total floor space of 500,000 sq. ft. is occupied by machine tools and equipment from abroad, for which

members of the M.T.T.A. are the importing agents. Comparison therefore can be made between British, American and Continental design. The level of production at which the industry can be maintained depends to a great extent on the apportioning of raw materials the industry requires. From the export point of view, it is hardly correct to say that by sending machine tools abroad we are enabling the industries in other countries to compete with our own. To prevent other countries from achieving industrial prosperity by refusing to sell them the equipment needed would be ineffective in that other suppliers would provide the tools we withheld.

Antofagasta (Chili) & Bolivia Railway

THE statement by the Chairman of the Antofagasta (Chili) & Bolivia Railway Co. Ltd., Mr. H. C. Drayton, accompanying the report and accounts for the year ended December 31, 1951, points out that despite many operating difficulties and a strike on the Chilean Section in February and March, the working results for 1951 show a substantial improvement over those of the previous year. The net operating receipts after deducting the loss on working the Bolivia Railway Company's lines of £154,709, exchange loss of £316,009, and the small loss on working the Aguas Blancas lines, amount to £925,569. After appropriation for renewals, there remains £741,777 towards provision for taxation, prior charges and payment on account of arrears of dividend on the 5 per cent. cumulative preference stock. The increase in net receipts over 1950 was caused mainly by the increase in traffic and partly by increases in tariffs; even so, working expenses were some 79 per cent. of gross receipts. After adding other income and balance brought forward, and deducting fixed charges and appropriations, the balance at December 31, 1951, was £448,551, which it is proposed to carry forward; appropriations include the payment of arrears of dividends (less tax) for the two years 1942 and 1943 on the 5 per cent. cumulative preference stock.

The following are some of the principal results:—

	1950	1951
Passenger journeys	526,951	728,074
Goods tonnage	1,196,105	1,380,876
	£	£
Passenger receipts	256,116	404,540
Baggage and parcels receipts	80,371	105,810
Goods and livestock receipts	3,188,452	5,741,645
Total receipts	3,832,890	6,848,492
Total working expenditure	3,519,996	5,194,891

Public goods traffic increased by over 15 per cent. Up traffic showed increases in mining and construction materials, Chilean products, gasoline in tank cars, and general merchandise, and down traffic in copper bars and ore and low-grade ores; there was some reduction in down traffic in general merchandise, manufactured nitrate, silver and low-grade ores from the Huanchaca Mines, and high-grade mineral ores. The number of passengers carried rose by 38 per cent. Stores shipments (excluding fuel oil) were valued at £252,329 compared with £465,191 in 1950; the latter figure, however, included £251,897 for Beyer-Garratt locomotives. Operation of the Aguas Blancas Railway resulted in a loss of £5,314 compared with £6,266 for 1950; the slight improvement was due to improved traffics, mainly sulphate of soda. The loss on working the Bolivia Railway Company's lines was £154,709, against £184,429 for the preceding year. Mr. Drayton draws attention to a new item under the heading of capital reserves, " equipment reserve," amounting to £483,238; this represents the proceeds of special increases in tariffs which have been granted by the Chilean and Bolivian Governments to be used only for the purchase of new rolling stock and other equipment for the railways.

The company recently ordered ten 4-8-2 type engines for the Chilean Section and six engines of the same design for Bolivia for delivery in 1954. It is also proposed to place orders for new wagon stock for the Bolivian Section. This is particularly necessary as during the past year, in spite of every effort to improve wagon turnround, existing stock has been working to capacity. As funds permit, it is also the company's intention to order new machinery for the workshops at Mejillones and Uyuni so that locomotive and rolling stock repairs may be effected with the maximum efficiency and the minimum of delay. Implementation of this programme depends on the company's continuing to receive sterling or dollar remittances from Chile and Bolivia in respect of these special funds.

The continued rise in the cost of living in both Chile and Bolivia led to demands during the year for further increases in salaries and wages. In Chile, the legal minimum salary for employees was increased in January, 1951, and in May the company's workmen were granted increased pay and allowances; these concessions were compensated by an increase of 23 per cent. in tariffs in force from February 22, 1951.

In Bolivia, employees and workmen asked for a 60 per cent. increase, but after negotiations, in which the Bolivian Government took part, the claims were settled on the basis of an increase of 30 per cent. as from February 16, 1951, compensated by a 20 per cent. increase in tariffs from the same date. There were no strikes in Bolivia in 1951, but in Chile the strike of private employees and workmen in February and March seriously curtailed traffic movement, and it was only by strenuous efforts on the part of the staff who remained at work and with the assistance of the authorities that passenger services were maintained and goods trains run carrying essential commodities.

The Chairman's statement alludes to proposed new articles of association for the company. These provide *inter alia* for stockholders to be entitled on a poll to one vote for every £1 of stock held, instead of only one vote for every £100 of preference or ordinary stock held, as at present; the new articles also give the Board express power to pay pensions to employees, including working Directors. Mr. Drayton records appreciation of the services of Mr. L. V. Keitley Duff, General Manager in Chile, of Mr. T. V. Woods, General Manager in Bolivia, and of all members of their staffs, and refers to the personal danger to which staff was exposed during the fighting accompanying the revolution in Bolivia.

Winter Train Services, L.M.R.

THE most outstanding improvement in the winter timetables of the London Midland Region, effective from September 15, is in the schedule of the 10.5 a.m. from Edinburgh to St. Pancras. All stops between Nottingham and London are cut out, so that this train now provides a good evening service from Sheffield at 5.4 p.m., and Nottingham at 6.25 p.m., to London, where the arrival time is 8.45 p.m., 41 min. earlier than before. The 9.12 a.m. from Bradford to St. Pancras is accelerated south of Sheffield (10.54 a.m.), and covers the 99·1 miles from Leicester to St. Pancras in 106 min., arriving at 2.15 instead of 2.30 p.m. and providing the fastest communication (3 hr. 21 min.) that Sheffield has had with London since the war. As last winter, however, this train runs on Mondays, Fridays, and Saturdays only; on Saturday 5 min. more is allowed for a stop at Luton.

The 7.55 a.m. from Derby is accelerated to arrive in St. Pancras at 10.42 instead of 10.54 a.m., covering the 72 miles from Kettering in 76 min. To provide for the stations previously stopped at by the 10.5 a.m. from Edinburgh, a semi-fast is run from Nottingham at 6.40 p.m., calling at all principal stations and reaching St. Pancras at 9.51 p.m. In the down direction the 9.40 a.m. " Thames-Clyde Express " starts at 9.50 a.m., and picks up its previous times by Carlisle; there is no other down alteration of note.

Out of Euston the only novelty is the 8 a.m. to Manchester and Liverpool, which in reality is the 8.45 a.m. retimed, and with a Liverpool portion added; after a call at Watford to pick up, the next stop is Crewe. It seems somewhat unfortunate that this train was not given a " special limit " timing, and that it is necessary for the Manchester portion to be held at Crewe no less than 14 min.; as a result, the arrivals at both Liverpool and Man-

chester are not until 11.58 a.m., and the train serves as little more than an advance portion of the 8.30 a.m. down Liverpool express, which calls additionally at Nuneaton (in place of the withdrawn 8.45 a.m. down) and carries a Manchester portion, due at 12.38 p.m. The 8 a.m. overtakes, before Crewe, the 6.40 a.m. down Windemere semi-fast, and so provides a new service to Warrington, Wigan, and Preston, reached at 12.45 p.m. On Saturdays, when the 8 a.m. does not operate, the previous 8.30 a.m. Liverpool and 8.45 a.m. Manchester trains are run.

In the evening the 6 p.m. "Mancunian" (first stop Wilmslow, 176·9 miles in 187 min., 56·8 m.p.h.) is relieved of its Colne portion, and restored to a "special limit" timing, so reaching Manchester at 9.30 p.m., in 3½ hr. from London. The 6.7 p.m. "Merseyside Express" (first stop Mossley Hill, 189·7 miles in 202 min., 56·6 m.p.h.) also is accelerated, and with stops of 4 min. at Mossley Hill and 5 min. at Edge Hill reaches Liverpool Lime Street at 9.50 instead of 10.5 p.m.

As was the practice before the war, the Colne portion of the down "Mancunian" now is attached to the 6.20 p.m. Preston train, which goes on to a "special limit" timing as far as Crewe (158·1 miles in 165 min.); the Colne section, accelerated 20 min., proceeds *via* Stockport. The 5.45 p.m. down "Midlander" also becomes a "special limit" train, with a booking of 100 min. over the 94 miles from Euston to Coventry, but is held there for 6 min. instead of the usual 4 min.; Birmingham is reached in 2 hr. 8 min.—the nearest approach to the old 2 hr. timing that has been seen since the war. The "Northern Irishman" (Stranraer boat train) is amalgamated for the winter with the second portion of the 7.20 p.m. "Highlander," and starts at 7.30 instead of 7.55 p.m., except on Fridays, when it leaves independently at 7.40 p.m. The 10.30 a.m. down "Manxman" (Liverpool non-stop) and the 11.10 a.m. from Liverpool to Euston are withdrawn for the winter, as last year.

In the up direction, except on Saturdays, the 5.25 p.m. "Red Rose" from Liverpool and the 5.50 p.m. "Comet" from Manchester both become "special limit" trains south of Crewe, the former running up from there in 165 min. and arriving at 9 p.m., and the latter at 9.25 p.m., 10 and 5 min. earlier respectively, each in 3 hr. 35 min. from its starting point. Also, except on Saturdays, the 8.20 a.m. from Liverpool leaves at 8.10 a.m., attaches at Crewe a portion which has left Manchester at 8 a.m., and reaches Euston at 12 noon instead of 12.18 p.m. The 10.5 a.m. from Manchester to London *via* Stoke arrives at 1.55 instead of 2.2 p.m.

It seems a pity that the non-stop up "Mancunian" cannot share with the down train a 3½ hr. timing; this could have been done, with practically no disturbance to any other train, by starting it at 9.50 a.m., and passing Crewe at 10.29 a.m.

On Sundays the running time of all express trains between Euston and Crewe is greatly increased, in most cases by from 15 to 30 min., presumably in view of permanent way work that is in contemplation at week ends. Many of the starting times from Euston are made earlier for this reason; the 11.15 a.m. to Wolverhampton starts at 10.40 a.m., the 1.10 p.m. to Blackpool at 12.55 p.m., the 1.20 p.m. to Holyhead at 1.15 p.m., the 2.30 p.m. to Liverpool at 2.20 p.m., the 2.50 p.m. to Manchester at 2.40 p.m., and the 3.35 p.m. to Blackpool at 3.20 p.m., but the 4.5 p.m. to Blackpool leaves at 4.10 p.m., and the 4.30 p.m. to Wolverhampton at 4.40 p.m.

On the Birmingham-Cheltenham-Bristol line most of the timings are eased out further, doubtless for permanent way reasons, involving, in the majority of cases, slightly earlier arrivals at and departures from Bristol.

Among other alterations, the 7.5 a.m. from Sheffield to St. Pancras starts at 6.55 a.m. and forms from Nottingham the 8.16 a.m. non-stop express, instead of the 8.30 a.m. semi-fast, bringing Sheffield passengers into London at 10.32 a.m., 50 minutes earlier. The 8.5 a.m. from Liverpool and the 8.10 a.m. from Manchester to Birmingham leave at 8.20 and 8.30 a.m. respectively and reach Birmingham at 10.47 a.m., an acceleration of 17 minutes from Manchester.

Field-Marshal Sir William Slim

BRITISH railwaymen still talk appreciatively of Field-Marshal Sir William Slim when he was a distinguished member of the railway service from September, 1947, to October, 1948. His latest appointment as Governor-General of Australia has given much pleasure to his railway friends in this country.

The period of Field-Marshal Slim's service with British Railways was not at all an easy one. The new organisation had to be designed and introduced at a time when the act of nationalisation was acutely controversial. Right up to January 1, 1948, the loyalties of the officers and staff were to their group companies, and great efforts and much patience had been required to secure this allegiance from the time of the railway amalgamations in 1923. In those days there were serious and prolonged differences of view, and clashes of personalities, and they persisted in greater or lesser degree for a number of years. It was not to be expected therefore that in 1948 all in the industry could immediately drop their old loyalties for the new idea of British Railways. There is no doubt that the presence of Sir William Slim, who was liked and respected by everybody, was of great assistance in smoothing the way.

The following two brief appreciations from Sir William's railway colleagues are representative:—Mr. J. C. L. Train, Member of the Railway Executive for Civil Engineering & Telecommunications, writes: "With his sincerity and interest in human beings, he never failed to impress railwaymen, as he had done soldiers, and in a relatively short service with British Railways his fellow members of the Railway Executive and many thousands of railwaymen who were privileged to see and hear the Field-Marshal, even if they did not meet him, came to the conclusion that the secret of his success, apart from his natural ability, was his human touch, and he left an impression which will live long after him."

Mr. K. W. C. Grand, Chief Regional Officer, Western Region, has said: "He impressed me immediately by being able at once to put one at ease—a trait I have noticed in other distinguished soldiers. He had a great sense of humour and a complete disregard of red tape—I even suspected that he was really intrigued to find how 'regulations' could be broken!"

Sir William Slim's humour at Railway Executive meetings is still remembered. He has a clear-thinking mind and is practised in the use of words. It may not be generally known that he used to contribute short stories to newspapers under a pen-name. His methods of preparing his radio scripts was amusing. He would struggle with a piece in his office until the time of the broadcast was getting painfully near, and write very little. At the last moment he would hurry across to his club and finish it off. Often it seemed unlikely that he would have it ready in time; yet the result was always very good indeed. A delightful picture of Field-Marshal Slim was just after he had left British Railways to become C.I.G.S. He visited the Schoolboys' Exhibition in uniform, spotted the model railway on display, and joined the boys who were about six deep around the stand, becoming as enthusiastic and animated as they were as the model trains raced round the track.

On another occasion one of the railway trade unions invited him to address a lunch-time London meeting. He prepared his notes, which were to do with railway affairs; but when he got on the platform he promptly forgot his brief and talked as he used to do to his troops. The room was packed, and when he finished he was cheered to the echo.

For all his skill at writing, Sir William Slim was not a desk man. His papers were never where they should be, and his secretary was constantly chasing them. This was not made any easier by the fact that he had a very large correspondence outside the railway. Soldiers who had served under him constantly wrote to him, and he always loved to hear from them. British Railways are happy for Australia that the Queen is to be represented by such a splendid couple as Field-Marshal and Lady Slim.

A. J. P.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

High-Speed Running in N.E. Region

August 27

SIR,—I was interested in the letter from your correspondent, Mr. Siddall, in your issue of August 15, on the subject of high-speed running by the 3.55 p.m. express from Newcastle to Birmingham; this is a train which I use often and upon the punctuality of which I have had frequent occasion to write favourable comment in the columns of the *British Railways* (*North Eastern Region*) *Magazine* and elsewhere.

Runs of 39 min. between Darlington and York by this train are not infrequent and I would confirm Mr. Siddall's timing for the run recorded by him on July 24. The important feature of this particular run, however, was the fact that this high average speed was attained by an "A2/3" class Pacific (No. 60517, *Ocean Swell*) with 6 ft. 2 in. wheels, whereas the majority of the numerous high-speed runs which I have recorded on the Darlington to York stretch have been achieved by the "A1" and "A3" class Pacifics with their larger 6 ft. 8 in. wheels. The best timing I have recorded this year by this train on the Darlington to York run was 38 min.; this was behind a Gresley "A3" Pacific.

Mixed traffic types of locomotives are often surprisingly lively performers on this and similar high-speed trains; on the last Wednesday in July a "Green Arrow" class "V2" 2-6-2 hauled the 3.55 p.m. Newcastle-Birmingham express from Darlington to York in 41½ min., averaging 75 m.p.h. between Northallerton and Thirsk, and reaching a maximum of 84½ m.p.h. through Raskelf.

Yours faithfully,

R. A. SAVILL,
Head of Research Section

N.E. Region, Commercial Superintendent's Office, York

Reconstruction of Friedrichstrasse Station, Berlin

July 8

SIR,—I feel that the article in your July 4 issue calls for some comment, in view of the fact that the work referred to was carried out in the immediate pre-war years.

The project of connecting Stettiner Station and the North suburban lines with Potsdamer Station and the South suburban lines, with interchange facilities with the East-West lines at Friedrichstrasse, was considered by many to be only partly a necessity, but more especially an unobtrusive way of constructing deep air raid shelters. How well the latter objective was reached is borne out by the last paragraph of your article.

Whereas the work at Friedrichstrasse may have been carried out without serious accident, the same cannot be said of the line as a whole. At one point not far from the station the roadway caved in, and several vehicles including a tram fell into the hole. Much loss of life resulted. Soon after that a fire swept through the workings under the Potsdamer Platz, and although it burned for several days, very little was heard about it. Incidentally, this last accident coincided with a fall of scaffolding at the Air Ministry building then under construction, which was explained away by huge posters "No accident has happened here."

Your article also recalls an experiment carried out at Friedrichstrasse and other Stadtbahn stations with "canned" loudspeaker announcements. The Bahnhofsvorsteher, resplendent in bright red cap, had the usual stick with a disc for signalling "Abfahren" to the guard. During the experiment the stick had a protrusion of about 2 in. above the disc, and before signalling, this official would poke this 2 in. end into a little hole on the platform, whereupon all the loudspeakers would chant the German equivalent of "mind the doors." The experiment was short-lived, presumably because nobody took any notice, as the broadcasts were of poor quality.

Yours faithfully,

G. LEISER

95, Cholmley Gardens, London, N.W.6

[Of the reconstructions described in our article only that of 1935-36 was caused by the driving of the north-south underground beneath the western end of the station. The others were necessitated by the growth of traffic, both suburban electric and long-distance, on the Stadtbahn, which traverses Berlin from west to east, mostly above street level. The building of the north-south line, on the other hand, may have been an extravagance, possible only in a totalitarian economy. The scheme was a long-mooted one. By linking three northern and three southern suburban lines it brought about desirable traffic and operating advantages. The route of this line through the city was carefully selected to tap also as much inner-urban traffic as the alignment could reasonably attract. The accidents which occurred during its construction included the collapse near the Brandenburger Tor when many workmen were buried and Ruhr miners and their equipment were flown to Berlin to speed the work of rescue.—ED., *R.G.*]

Euston Shareholders' Meeting Room

September 2

SIR,—I am told that the Shareholders' Meeting Room at Euston Station, first opened by the L. & N.W.R. in 1849 and now used by the British Transport Commission's Historical Relics Section, is the only room specially built for the regular meetings of railway shareholders.

I wonder whether any reader could confirm or refute this claim.

Yours faithfully,

FRANK FERNEYHOUGH

31, Hatfield Road, St. Albans, Herts.

[We are informed by the L.M.R. that the shareholders' meeting room at Euston was the only one of its kind on any of the railways constituting the L.M.S.R.—ED., *R.G.*]

Rail-Bus Connections

July 28

SIR,—There are excellent reasons why little-used branch lines of British Railways should be closed and the traffic transferred to the roads. Not the least is the advantage to travellers of arriving at the centres of small towns rather than at stations which are often a mile or more outside.

Not so clear are the reasons for completely obliterating from Regional timetables the places served by the defunct branch lines. Recently, when endeavouring to make arrangements to travel from London to Burnham Market, Norfolk, and on being informed that the branch line had now been closed, I had great difficulty in ascertaining times of connection of local buses and times of arrival of these buses at Burnham. It was only after a personal visit to B.T.C. headquarters, where the staff was most helpful, that I obtained the necessary information.

Now that the subject of public transport is very much to the fore, the time might be opportune to press the Commission to indicate in Regional timetables places of interchange (which in the instance quoted above had been altered from Heacham to Hustanton) and times of departure and arrival of buses connecting with the main trains of the day to and from the more important towns and villages now no longer served by the railway. Where the B.T.C. controls the provincial bus services, the travelling public is entitled to a comprehensive timetable covering the services of all forms of transport.

Yours faithfully,

D. W. MOUNTAIN

"Prescelly," Harbury Road, Carshalton

THE SCRAP HEAP

Shock Tactics

A guard was throwing the points over to switch a train to a main line at Lake Boga, Victoria, Australia. Just then an 18 in. lizard ran up his trouser leg. The shock made him swing the points back. Three loaded trucks crashed and tore up the track. The lizard escaped. —*From "The Daily Graphic."*

Flying Fire Alarm

While in flight between Thirsk and Northallerton, the pilot of an R.A.F. aircraft noticed that one wagon of a parcels train below was ablaze. He radioed the news to base and fire engines were sent out to meet the train at Otterington. The fire took an hour to be got under control and many parcels were damaged.

Shaggy Dog

The compartment of the stopping train from Stockport to Liverpool gradually filled until there were six passengers on one side and five passengers and a shaggy-coated mongrel dog on the other. The dog, head on forepaws and half asleep, made itself quite at home. . . . At Glazebrook a further passenger entered. He stood for a while and then forcibly informed all and sundry that it was a bit of a so-and-so if a dog could have a seat while he had to stand. There was no response, so the passenger looked pointedly at the man sat next to the dog. "Don't look at me," said that individual. "It's not mine." The standing passenger than transferred his gaze to a woman sat on the other side of the dog.

"It's not mine either," she protested. "It jumped in at Stockport and I thought it belonged to someone already in." None of the others claimed the dog. Quickly the standing man scooped it off the seat and sat down. As the door opened at the next station—Risley, the home of many civil servants—to admit another passenger the dog jumped out. "Fancy coming all this way for a drink of tea," said the man in the corner.—*From "The Manchester Guardian."*

"Great Northern" to Blackpool

On September 20 an eleven-coach special train chartered by the Northern Rubber Co. Ltd., of Retford, will run from Retford to Blackpool North, *via* Doncaster, Wakefield, Todmorden, and Blackburn, and will be hauled, appropriately, by "A1/1" class Pacific locomotive No. 6013, *Great Northern*. It is believed that it will be the first time for a locomotive of this type and class to traverse this route throughout. The train will leave Retford at 10 a.m. and reach Blackpool North at 1.42 p.m.

Dieselisation

"Have you dieselised today?" asks a Sydney newspaper, in gentle raillery at the "dieselisation" of the railways. It admits that the word, in this context, may be the very one to enrich the language of these modern, mechanical times; but it points out that for a good hundred years nobody has found it necessary to refer to the "steamisation" of the railways. We cannot deny that if the imagination of the age has waxed mechanically, it has waned etymologically. Jargon and cliches have tended to replace sound and pleasant word-building.

We in the Victorian Railways are by no means guiltless. Neither are newspapers, for that matter. But such words as we have coined usually have the merit of exactitude. Dieselisation, if ugly and repugnant to fastidious taste, says exactly what it means.—*From "Victorian Railways News Letter."*

Railway Amalgamation Projects

. . . How is the public to fare under the remedy suggested . . .? Mr. Denison (Chairman of the Great Northern) . . . throws the public over at once, and looks to his company alone, as a director should. "Our railways," says he to the Chairman of the Midland, "compete with one another in the south and north; they cross each other at two or three important points; there are double stations at several towns, and duplicate trains run where single ones would serve the public equally well. By amalgamations, therefore, a very large annual expenditure would be saved, which would improve the dividends and the real values of both properties."

How came the Great Northern and Midland to compete with each other, and cross each other, and intersect each other, and have double stations in the same towns? Because those identical privileges were obtained from Parliament. And how were they obtained? By proof that such competition was good, wholesome, and for the manifest advantage of the country; that the traffic of the country supplied abundant aliment for double lines of railway, and that, new communication being usually improvements upon the old in direction of route and excellence of construction, the public was sure to gain by the encouragement given to such adventures. What, in short, is the Great Northern itself but the very offspring and creation of those identical principles which its Chairman now discards? If anybody could have borrowed Mr. Denison's words seven years ago, there would never have been a station at Kings Cross nor one of the best lines in Europe between that point and Newark or Lincoln . . .—*From "The Times" of August* 21, 1852.

The "Lion" in Films

The old Liverpool & Manchester Railway locomotive "Lion" on the Limpley Stoke to Camerton line of the Western Region during the making of the Ealing Studios film, "The Titfield Thunderbolt" dealing with the closing of a rural branch line (*see our May* 16 *and August* 22 *issues*)

From One Generation to Another

Some like electric, some like steam,
And we have lots of fun
In claiming for our preferences
Their due amount of sun.
A little friendly bickering,
Most people would agree,
Salted and spiced with humour,
Is good for you and me.
Our object, after all, is but
To interest and amuse,
Always remembering, of course,
That *qui s'excuse s'accuse.*

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW ZEALAND

Railways Corporation

Even if legislation is passed later in the present Session of Parliament to set up a railways corporation as recommended by the Royal Commission, the responsibility for railway policy will still rest with the Minister of Railways and, collectively, with the Government.

The legislation being framed will differ from the Government Railways Amendment Act, 1931, which, with certain exceptions, transferred all the powers, duties, and functions of the Minister, the General Manager and the permanent head of the Department to a Government Railways Board of five members.

NEW SOUTH WALES

Additional Coal-loading Facilities

To meet the Joint Coal Board's estimated additional coal output of 10,400 tons a day in the current year and its demand for a total daily movement by rail of 42,700 tons, the Railway Department is taking steps to improve and expand the coal-handling equipment in the Newcastle area. When materials can be made available, two catenary bunkers, each with a capacity of 90,000 tons, as well as additional coal-stacking area and one temporary and five permanent shiploaders with capacities of 300 and 500 tons an hour are to be provided.

UNITED STATES

California Earthquake Damage

The San Joaquin Valley line of the Southern Pacific Railroad suffered severely in the earthquake of July 21. Tehachapi, the epicentre, is the site of the remarkable series of spirals, partly in tunnel, by which the line climbs over the mountainous country separating Los Angeles and Mojave from Bakersfield. Four tunnels, with a combined length of 2,565 ft., were damaged, one, 361 ft. long, so badly that it is to be abandoned and 2,000 ft. of new line are to be built to bypass it. A second, 334 ft. long, is being converted to an open cutting, and 200 ft. of a third also is being opened out. The longest of the tunnels, one of 1,700 ft., will require to be relined throughout.

In general, the damage was confined to some 3½ miles of line, including the Tehachapi spirals; in addition to the damaged tunnels, landslides in cuttings have to be cleared, collapsed embankments repaired, and much affected track relaid. During the emergency, local passenger traffic has been conveyed by bus, and freight traffic diverted as far as possible to the shorter Coast Line route between San Francisco and Los Angeles.

The New York, Ontario & Western

For some time past the New York, Ontario & Western Railway, a 547-mile line connecting Weehawken, on the New Jersey side of New York Harbour, with Oswego on Lake Ontario, and with branches to Port Jervis, Kingston, Scranton, and Utica, has been insolvent, the total debt, including mortgages, being about $60,000,000. An offer of $3,000,000 in cash, as, presumably, the first instalment of a purchase price which has not yet been disclosed, has now been made for the N.Y.O. & W. by a New York lawyer, Mr. Lincoln Epworth, and there is a possibility that the railway may be reorganised and operated under joint management with the New York, Susquehanna & Western, a smaller line also in the hands of receivers.

The New York, Ontario & Western, almost exclusively a freight carrier, owns 40 diesel-electric locomotives; the New York, Susquehanna & Western has a busy suburban traffic, diesel-operated, between Susquehanna Transfer, New York, Paterson City, and Butler, 38 miles distant, but the remainder of its line, to Hanford, New Jersey, and Hainesburg, Pennsylvania, carries freight traffic only.

FRANCE

Rail-Road Co-ordination

As the result of a directive by the Minister of Public Works & Transport, the S.N.C.F. and the French Road Haulage Federation (Fédération Nationale de Transports Routiers) are discussing possible ways of co-ordinating long-distance rail and road freight services. A report is to be made to the Minister on the broad lines of agreement to assist him in the formation of a comprehensive policy.

Capital Investment Policy

A recent statement by the Minister of Public Works & Transport emphasised that any authorisation of capital expenditure would be based on transport requirements in general, and not on the demands of one form of transport. Work on the electrification of the Valenciennes-Thionville line would be authorised only with this proviso in mind, and investment in railways would be co-ordinated with the modernisation of roads and inland waterways.

WESTERN GERMANY

Location of Railway Headquarters

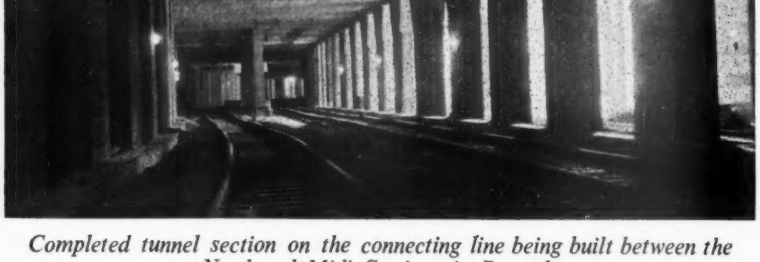
Divergent views on the future seat of the Federal Railways headquarters are entertained by the various authorities. Recently, the administration of the Federal Railways confirmed its decision taken in June last, to transfer its headquarters, at present at Offenbach, to Frankfurt. This is opposed by the Federal Government at Bonn, which intends the railway headquarters to be located in the Cologne/Bonn area where it considers the headquarters of all State administrations should be centralised. There is also disagreement between the Federal Railways administration and the Federal Ministry of Transport as to who is to determine the location of the railway headquarters; both parties quote recent legislation in support of their claims.

SWEDEN

Baltic Train Ferries

The Eastern German State Railway authorities have asked the Swedish State Railways to transfer the present train

Brussels Junction Railway



Completed tunnel section on the connecting line being built between the Nord and Midi Stations in Brussels

ferry worked by the Swedish railways between Trelleborg, in Sweden, and Sassnitz, on the island of Rügen, in Eastern Germany, to Warnemünde, also in East German territory. As this would increase the sea crossing by one-third and create timetable difficulties, the Swedish authorities are stated to be considering suspension of direct traffic between Sweden and Eastern Germany and routing all traffic *via* Denmark.

Before the partition of Germany, Warnemünde was the terminus of a train ferry to and from Gedser, in Denmark, on the then main route between Berlin and Hamburg, on the one hand, and Copenhagen on the other. Traffic between Berlin and Stockholm and between Berlin and Oslo *via* Gothenburg before the war was routed mainly *via* Sassnitz and Trelleborg.

AUSTRIA

Federal Railways Deficit

The working receipts of the Federal Railways in the first half of the year were Sch. 1,503 million and the working expenditure was Sch. 2,055 million; there was thus a working deficit of Sch. 552 million. It is expected, therefore, that the estimated working deficit of Sch. 876 million for the complete year will be greatly exceeded.

Expenditure will be curtailed, although, so far, investments have absorbed only Sch. 175 million, or 35·3 per cent. of the total which had been allocated for the year. The electrification of the Linz-Vienna main line (118½ route-miles) is to be completed, but it is thought that the conversion of the Villach-Klagenfurt-Bruck a/d Mur-Vienna main line (231 route-miles) which, according to the original project, was to have been completed by 1955, will have to be postponed.

U.S.S.R

New Lines

In accordance with the provisions of the 1951-55 Five-Year Plan, the mileage of new railways to be completed within this period are to be two-and-a-half times more than that of the lines completed in the preceding Five-Year Plan (1946-1950). In Southern Siberia, the 870-mile line from Akmolinsk-Abakan is to be completed. Akmolinsk, north-east of the Aral Sea, is the terminus of a main line from Kartali, in the Urals, and Abakan is to the south-west of Krasnoyarsk (on the old Trans-Siberian line). The Akmolinsk-Abakan line was referred to in the August 22, 1947, issue, and is shown in the Siberian railway map published in the May 25, 1945, issue.

The building of the projected lines from Krasnoyarsk to Yeniseisk, some 186 miles further north, and from Astrakhan and Guriev, along the northern shore of the Caspian Sea, connecting the mouths of the Volga and the Ural rivers, will be abandoned. The proposed line between Agriz, Pronino and Surgut will not be built. Surgut is in Western Siberia on the River Ob, east of its confluence with the River Irtish.

A line between Tchardzhui and Kungrad in Uzbekistan (east of the Aral Sea and south of Akmolinsk) is to be completed, and that between Kungrad and Makat to be begun. The Uzbekistan line was referred to in the December 17, 1948, issue. Kungrad is a port on the northern shore of Lake Balkash.

Publications Received

Le Mont Cenis—Sa Route, Son Tunnel (The Mont Cenis Road and Tunnel). By Albert Duluc. Paris 6e: Hermann & Cie., Rue de la Sorbonne. 10 in. × 6½ in. 150 pp. No price stated.—The author of this valuable contribution to the history of European land transport is an official of the French National Railways. The history of the pass is traced from its legendary passage by Hannibal and his elephants to the present day. The story of the Fell railway over the pass, which preceded the railway tunnel (more properly known as the *Tunnel du Fréjus*), of the building of the tunnel, of the electrification of the railway, and of the destruction of the tunnel during the last war and its subsequent restoration, is told in detail. Professor Georges Friedmann, of the Conservatoire des Arts et Métiers, Paris, contributes a preface. The treatise is fully documented.

A.C. into D.C.—The range of applications for metal rectifiers illustrated and described in this new 48-page brochure from the Westinghouse Brake & Signal Co. Ltd. will introduce many readers to possibilities they may not previously have considered. Among them is the use of rectifiers to provide heavy d.c. current for the overload adjustment of circuit breakers, and an installation of this type at the Acton Works of London Transport for currents up to 2,000 A. is illustrated. Another purpose outside the better-known applications is the connection of a bridge rectifier in the power circuits of electric trucks supplied from trolleywires, such as those employed for transporting ingots in steelworks. Remote reversal of the trolleywire polarity is thus arranged to reverse the series motor without involving any switchgear for the purpose on the vehicle, because with either polarity and direction of armature current the field current continues to flow the same way. Familiar applications, such as the increasingly important one of battery charging for electric trucks, are also represented. The first 24 pages of the brochure present a useful technical review of metal rectifier characteristics and circuit practice.

Power to Spare.—A recent issue of the house magazine of Oldham & Son Limited, *Power to Spare*, includes an article, "Clear Road Ahead," dealing with the applications of electricity in railway signalling. The article traces the development of electrical signalling systems from the telegraph through the early block instruments and lock and block system, to the many controls and automatic devices in use at the present day. The article concludes with a brief description of the relay interlocking schemes at York and on the Liverpool Street to Shenfield section of the Eastern Region.

Rapier Mobile Cranes.—A series of illustrated leaflets giving details of Rapier 5, standard, and Rapier 8, super mobile cranes has been issued by Ransomes & Rapier Limited. The cranes are powered by a Perkins P.4 diesel engine 38·5 h.p./1,800 r.p.m., or alternatively by a Morris M.E.B. petrol engine 41·5 h.p./1,800 r.p.m. The standard model has a lifting capacity of 11,200 lb. with an outreach of 3 ft. 8 in. and 25 ft. 9 in. ceiling and the super model 19,000 lb. with an outreach of 4 ft. 7½ in. and 26 ft. 9 in. ceiling. With each the lifting capacity decreases as the outreach increases. Two-speed hoists giving a 40 per cent. increase in speed for loads up to half maximum can be fitted at extra cost.

Application of Cast-Iron Segments.—The application and uses of cast-iron segments for tunnelling is dealt with in a recent publication issued by Head, Wrightson & Co. Ltd. Some excellent examples are provided in a number of half-tones which include the London Underground railway system, and the strengthening of a main-line tunnel on the Southern Region, British Railways. The brochure includes drawings of typical cross sections, longitudinal and circumferential joints, together with the specifications of cast-iron tunnel segments.

Corrosion and Temporary Protectives.—Corrosion of metals and its prevention are dealt with in a recent book published by Shell Petroleum Co. Ltd. The first part is devoted to a brief survey of the mechanism of electrochemical attack, and the second part to the application of petroleum-base protectives, types and selections, with some notes on Shell Ensis oils. Shell Ensis grades are grouped according to their physical characteristics and suitability for specific applications, which provide for short-term protection of precision tools or metal parts or assemblies, or long-term protection of machinery and equipment during shipment. Ensis oils, specially blended, are suitable for protection against corrosion of internal working surfaces of engines and types of machine during storage or shipment. Those oils also contain additives to neutralise acids formed during the combustion of I.C. engine fuels. Copies of the book are available from any Divisional Office of Shell-Mex and B.P. Limited.

XUM

Locomotive Design Ratios

Problems which arise in producing a boiler having good steaming qualities

By Geo. W. McARD, A.M.I.Mech.E.

AS the result of accumulated experience the proportions of many parts in engineering products can be verified with assurance in most branches of engineering, by comparison with values and ratios which have proved to have given good results in actual service. In the early days the method of trial and error was the only possible way open to a designer, and from many designs reliable ratios have been arrived at which are proving valuable aids in the production of modern power plant.

In locomotive design an important sphere in which the proportions may be checked is the boiler for which there are many sound ratio values available. The heating surfaces and grate area are settled primarily by the quantity of steam which these may be expected to generate, assuming certain grades of fuel and rates of firing, in relation to the cylinder steam demand. The length of tubes may be influenced by the design of engine, and the diameter of the tubes decided with a view to ensuring a satisfactory area for the flow of gases and a good ratio relative to the tube inner surface. While design primarily rests on fundamental calculations experience assists by a comparison of like with like, and several examples could be given, where the violation of recorded experience has been dearly paid for.

It is proposed to give at the outset the ratios most frequently used, and follow with such comments as may be helpful. In some cases it will be noted that the extremes quoted afford wider margins than in others; in the former the latitude can be justified by special factors which are in operation, while in the latter the narrow limits emphasise the fact that prudence forbids taking a chance on ratios which fall outside the limits stated, unless there are adequate reasons for so doing.

The following are the ratios most frequently used:—

Evaporative heating surface/grate area 60 ranging between 50 and 72.
Evaporative heating surface/firebox heating surface 10 ranging between 8 and 12.
Evaporative heating surface/small tube heating surface 1·75 ranging between 1·5 and 2.
Evaporative heating surface/large tube heating surface 3·5 ranging between 3 and 4.
Evaporative heating surface/superheater heating surface 4 ranging between 2·75 and 5·5.
Superheater heating surface/grate area 14 ranging between 10 and 17.
Firebox volume/grate area 6·5 ranging between 6 and 7.
Firebox volume/firebox heating surface 1 ranging between 1 and 1·25.
Firebox volume/total free area through flues and tubes 40 ranging between 37 and 45.
Grate area/total free area through flues and tubes 9 ranging between 7 and 12.
Small tube heating surface/firebox heating surface 6·5 ranging between 6 and 8.
Firebox heating surface/grate area 5 ranging between 4·75 and 6.
Total free area through flues and tubes/free area in flues alone 2 ranging between 1·75 and 2·25.
Steam space above water level 8 to 12 times total cylinder volume.

The relation of evaporative heating surface to the grate area has varied considerably in the past, and this, in the writer's opinion, partly explains why some boilers have proved poor steamers, while others needed no forcing even when hauling a heavy load up a stiff bank. Ratios over 60/1 are seldom found today where the engine is called upon to fulfil heavy duties, those today tending more frequently towards the 50/1 level. In the accompanying table a number of ratios are given for modern locomotives and these show the trend of design is towards larger grates and easier steaming capabilities, boilers rarely having to be forced except under extreme conditions.

Firebox Design

Firebox heating surface areas also tend upwards in most designs, partly by reason of the larger grate, but largely due to an appreciation of the high value of this section of the evaporative heating surface. The wider adoption of the Wootton (or similar) firebox is a further favourable point, this design being often used in combination with a combustion chamber and, in many boilers, thermic syphons.

The provision of a superheater tends somewhat to reduce the evaporative heating surface from the level formerly obtained in the saturated steam generator, but these two factors, *i.e.*, increased firebox heating surface and restricted evaporative heating surface, give a distinctly better ratio and, what is more important, better steaming capacity, particularly where coal is of an inferior grade. In a number of cases evaporative heating surface/firebox heating surface ratios are better than the 10/1 of established practice, chiefly due to the endeavour to secure the utmost the design will afford to compensate for the low grade fuels compulsorily used today.

The proportion of small tube heating surfaces relative to the total evaporative heating surface is affected also by the more recent trend of increasing the number of superheater elements in order to obtain a greater volume of steam and a higher degree of superheat. An increase in the number of flues naturally reduces considerably the number of small tubes, and one finds not a few modern designs where the ratio in question is in advance of that which has been regarded hitherto as the acme of good design.

The ratios given in the above list for the total evaporative heating surface/large tube heating surface cover most modern engines, though exceptions arise here as in all fields. It is worth noting that while the mean value quoted, *i.e.*, 3·5 gives good results, practice today appears to tend to the lower value given, thus confirming the fact already mentioned that the superheater is increasing its demand on the available tube space, and on the confidence of designers in its ability to provide ample steam in spite of a reduction in the total evaporative heating surface for so many engines.

A comparison of the evaporative and superheating surfaces has suggested a range of 2·75 to 5·5, with a good mean around 4. In the table of comparative ratios it will be seen that the average works out at 4·27 with minimum and maximum values of 2·98 and 5·55. As this ratio approaches the 3·5 mark the

COMPARATIVE RATIOS OF SOME RECENT LOCOMOTIVES		British Railways, class "7"	British Railways, class "6"	British Railways, class "5"	British Railways, class "4"	British Railways, class "4" tank	British Railways, class "3" tank	Indian Government Railways, "WP" class	British Railways, Southern Region "Merchant Navy" class	Western Australian Government Railway, "W" class	Tasmanian Government Railways, 4-8-2 Type	Victorian Government Railways, "R" class	Averages
Evaporative H.S./Grate Area	(60)	59	58	58	54	51	52	49	50	41	47	53	52
Evaporative H.S./Firebox H.S.	(10)	11·8	10·6	9·7	10·1	9·6	8·9	8·1	8·9	6·1	9·2	7·9	9·2
Evaporative H.S./Small Tube H.S.	(1·75)	1·93	2·03	1·68	1·55	1·55	1·57	2·04	1·97	2·19	1·69	1·73	1·81
Evaporative H.S./Large Tube H.S.	(3·5)	2·53	2·42	3·32	3·94	3·97	4·02	2·59	2·62	2·66	3·35	3·4	3·17
Evaporative H.S./Superheater H.S.	(4)	3·52	3·37	4·47	5·45	5·55	5·53	3·25	2·98	3·66	4·28	4·87	4·27
Superheater H.S./Grate Area	(14)	16·8	17·1	12·9	9·9	9·2	9·3	15·1	17	11·3	10·9	11	12·8
Firebox Volume/Grate Area	(6·5)	6·5	6·9	5·95	4·92	4·92	5·25	6·5	6·2	6	5·3	6·44	5·9
Firebox Volume/Firebox H.S.	(1)	1·3	1·27	1	0·92	0·92	0·91	1·07	1·09	0·88	1·04	0·95	1·03
Firebox Volume/Total Free Area, Flues and Tubes	(40)	40	43	37	35	35	35	46	47	50	47	59	43
Grate Area/Total Free Area, Flues and Tubes	(7)	6·2	6·3	6·3	7·1	7·1	6·6	7·4	7·6	8·4	8·9	9·2	7·4
Small Tube H.S./Firebox H.S.	(6·5)	6·1	5·2	5·7	6·5	6·1	5·7	3·96	4·5	2·77	5·4	4·56	5·13
Firebox H.S./Grate Area	(5)	5	5·4	6	5·3	5·3	5·8	6·1	5·7	6·8	5·1	6·8	5·75
Total Free Area, Flues and Tubes/Free Area, Flues only	(2)	1·64	1·59	1·96	2·17	2·17	2·07	1·69	1·68	1·6	1·95	1·82	1·85
Adhesive Load/Tractive Power at 85 per cent. M.E.P.		4·23	4·51	4·95	4·55	4·8	5·07	4·06	3·76	4·03	3·88	4·08	4·36

Table of ratios of British Railways and recent overseas locomotives

degree of superheat obtainable will normally rise for engines which are operated non-stop over long distances under heavy load, as, for example, the London to Glasgow or Edinburgh expresses.

A somewhat unusual value is found in the ratio of superheater heating surface to grate area, yet one which has a very logical basis, since the larger the grate (within reasonable limits) and, therefore, the fuel consumed, the higher should be the superheat temperature. Reasoning conversely is equally logical, since an engine with an abnormally high proportion of superheater heating surface per sq. ft. of grate area would appear to be starved of the heat so essential to good working. Out of 252 recorded engines only 12 were found to be outside the maximum value quoted (17), though a number were below the minimum figure (10), and of these many related to engines fitted with a special design of superheater. Of 52 Beyer-Garratt engines tabulated, not one exceeded the 17/1 ratio and most were in the 10/1 region, with a number slightly better, thus showing the excellent opportunities afforded by the Beyer-Garratt type of locomotive.

Important Ratios

A most important ratio is that of firebox volume to grate area, and it is interesting to note the narrow margin allowed. Obviously the two factors go hand-in-hand, as the bigger the grate the larger will be the amount of coal burnt, and the weight of combustible gases released, the latter demanding a minimum weight of air per lb. for complete combustion. Too small a firebox volume means waste of valuable fuel through incomplete combustion, and to create too high a gas velocity through the furnace, so facilitating the rapid escape of the finer unconsumed particles of coal.

R. P. Johnson, in his book on "The Steam Locomotive," published in the U.S.A., refers to speeds over 260 m.p.h. for the gases as these pass over the brick arch, notwithstanding the advantage afforded by a combustion chamber, and states that a 10 per cent. increase in firebox volume will increase the efficiency of combustion approximately 3, or 25 per cent. for overall boiler efficiency. It will be seen that this ratio works out at 6·5/1 and 6·9/1 for British Railways classes "7" and "6" engines respectively.

While discussing the above, it is interesting to refer to another ratio in which the firebox volume occurs, *viz.*, that in which it is related to the firebox heating surface, and here again the margin is a fine one. If the previous ratio is approved from a consideration of the boiler design, the present ratio can be settled on the assumption that the firebox volume already obtained may be regarded as correct, and as the firebox portion of the evaporative heating surface is so valuable in steam generation, the importance of maintaining a good ratio relative to the firebox volume needs no stressing.

The ratios of British Railways standard engines for classes "7," "6," and "5" are 1·3, 1·27 and 1 respectively, and Bulleid's "Merchant Navy" class engines have a ratio of 1·09. Where the firebox alone fails to give the desired value the addition of a combustion chamber can be made to correct the related proportions.

So far as the flues are concerned it is now proposed to relate the combined free gas areas of the whole (large flues and small tubes) to the firebox volume. This is useful as the gases generated in the firebox must escape through this free area, and it is interesting to note the high speed of the gases as they pass into the tubes, over 200 m.p.h. being reached in many boilers. These speeds tell their own tale in the higher back pressures found in the cylinder and necessary to produce the draught. Where the free area through the flues follows the lower ratio a distinct improvement in back pressure will be noted.

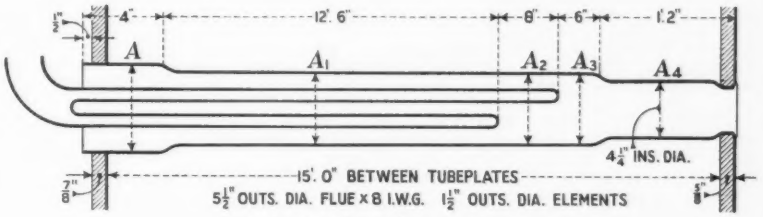
A total flue area is also properly related to the grate, as the latter determines the amount of fuel that may be consumed, and the flue area the outlet for the gases generated therefrom. The margins are wider in this ratio chiefly on account of the greater variation in the calorific values of the fuels used. Another point which should be kept in mind concerns the big variation in firing rates to which a locomotive boiler is subjected, these varying from 40 to 180 lb. of dry coal per sq. ft. of grate per hr.

In order to ensure good proportions for the different banks of tubes, now that the free area of the total has been dealt with, it is desirable to relate the heating surface of the small tubes to that of the firebox. The small tubes only are considered, as the sole function of this bank is that of evaporation, whereas the large flues combine this duty with that of housing the superheater elements, the gases through the latter bank providing heat for evaporating and superheating purposes.

The lack of balance in the relation of firebox heating surface to grate area has seriously affected the good steaming qualities of many boilers The fact has already been stressed that the firebox surface, including thermic syphons and arch tubes, is the most valuable in its steam generating function, and for this reason it is deemed essential to provide not less, preferably more, than 5 sq. ft. to every sq. ft. of grate.

Some authorities consider that 40 per cent. of the steam generated can be credited to the firebox heating surface, and one American investigator regards an evaporative rate of 125 lb. per sq. ft. of firebox surface more nearly correct than that usually accepted; 55 lb. per sq. ft., when working at full capacity. As this figure is so much above the normal it serves to emphasise the desirability of increasing this area to the maximum possible within the ratio limit (6) given.

An important ratio in the flues and tubes is that known as the A/S ratio, of the free gas area/the gas swept surfaces. For the small tubes this is obtained by relating the area of the tube bore to the swept surface available inside the tube. For a tube 2 in. bore extending for a length of 16 ft. the ratio becomes $(2^2\pi/4)/2\pi192$ or 1/384, and this is considered quite satisfactory.



Superheater flue tube and element

The calculation of the free gas area for the flue tubes is a different proposition, since these house the superheater elements. It is obtained by calculating A, the free gas area for each of the several sections of the flue, as shown in the above drawing. Multiply each of the values found by the length of its section, and divide the sum of the several products by the length of the flue. The sum of the results gives a combined value for A. To ascertain S calculate the total area of the gas swept surfaces of the flue and the element, and combine the two. A good average value to aim for, for the A/S ratio is around 1/400, with 1/360 or 1/370 for the smaller and shorter boilers.

The calculations involved for a typical flue as shown above are as follow:—

A	= 15·62	× 0·333	=	5·1546
A_1	= 14·005	× 12·5	=	175·0625
A_2	= 17·54	× 0·66	=	11·5764
A_3	= 21·074	× 0·5	=	10·5370
A_4	= 14·186	× 1·16	=	16·4557
				218·7862

$$\therefore \frac{218{\cdot}7862}{15{\cdot}1667} = A = 14{\cdot}425$$

S_1	= 0·333	× 1·407	=	0·4685
S_2	= 13·6667	× 1·3561	=	18·5334
S_3	= 1·1667	× 1·1135	=	1·2991
S_4	= 13·1667	× 4 × 0·3927	=	20·6820
				40·9830

$$\therefore 40{\cdot}983 \times 144 = S = 5901$$

$$A/S = 14{\cdot}425/5901 = 1/409$$

When calculating the free gas area through the flues and tubes this will be done separately for each, and another ratio should be taken for the total free gas area/free gas area in the flues alone. This for different units will vary from 1·75/1 to 2·25/1, a good average value being around 2/1. By carefully balancing the several sections as well as the whole, with related surfaces, a good

steam producer can be relied on, always assuming that the maintenance department functions efficiently in keeping the tubes and surfaces reasonably clean and free from soot and other accumulations. For this reason many engines are fitted with independent steam blowers—Parry, Diamond or other—and these units have been found most useful in service.

No superheater will function satisfactorily if the steam coming over from the boiler is heavily impregnated with moisture, and a feature that tends to this condition is the provision of too small a steam space above the water level. Furthermore, the presence of moisture in the steam entering the superheater elements sets up incrustation inside the elements, especially at the bends, resulting in a greatly reduced efficiency and life of these parts. For this reason all designs should ensure a generous space above the water level with water at half glass height as a minimum, and the maximum value (12) should be aimed at.

It is interesting to note that the Indian Railway Board in 1950 recommended the following ratios for future boiler designs:—

Firebox volume/grate area = 6·5 minimum for hand firing (a larger volume preferred) = 8 minimum for mechanical stoking.
Free gas area (tubes and flues combined)/grate area = 12 per cent. minimum (a larger volume preferred).
S/A for non-coking coals when fired at a rate of 100 lb. per sq. ft. of grate area per hr. to be
400 maximum for superheat temperature up to 700° F.
380 maximum for superheat temperature up to 720° F.
S represents the total gas swept surfaces of the flue tube and element.
A represents the free gas area of various sections of the flue tube × by their portion of the length of the flue tube ÷ by the total length of the flue.

The factor of adhesion varies between the limits of 3·5 and 5 on different systems and engines, for reasons that are easily explained in most cases. The smaller ratios (3·5 and thereabouts) are often the inevitable compromise on an engine where high tractive power is demanded by the operating department on an axle load severely restricted by rail and track strength. In such cases power sanding equipment must be kept in first-class working order. Where engines do considerable work through cuttings in which the rail surfaces are fouled by decayed vegetation during the greater part of the year, the higher ratio is resorted to as nearly as possible.

The power/weight ratio is an important factor in most forms of traction, and where of a high order the inference which may be drawn is usually that of high acceleration. In locomotive design this ratio is seldom considered, since the conditions are quite dissimilar to those which prevail in, say, road transport, but the writer found, some years ago, when examining a large number and variety of engines, that an average figure came out at approximately 116 lb. per cylinder h.p. for tender engines, naturally excluding the tender. Tank locomotives worked out at a higher figure, but the values for this class were influenced too greatly by the water and fuel capacities, and were not considered of much use.

Swedish Refrigerator Train

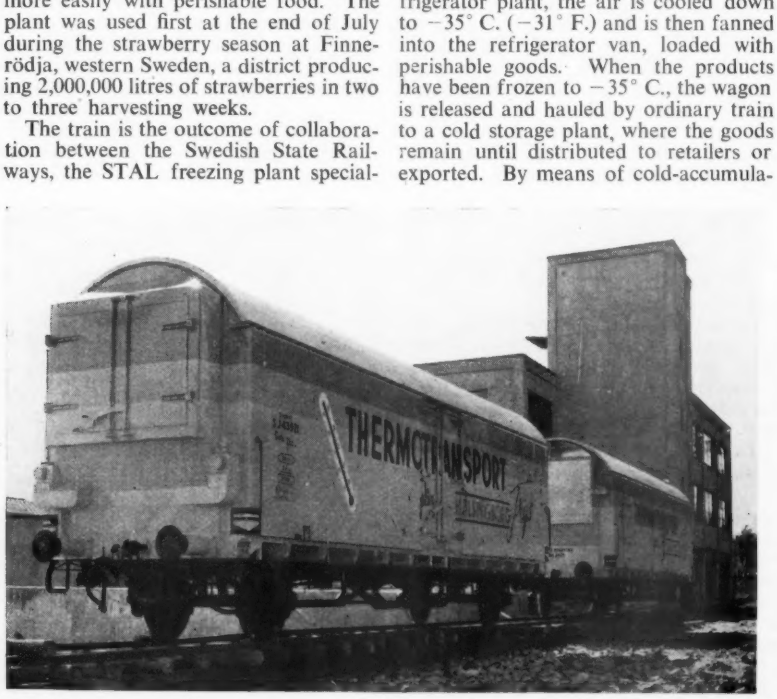
Mobile service for transport of agricultural and similar products

THE Swedish State Railways have introduced a mobile refrigerator service known as the "Thermo Train." It has been built to the designs of leading Swedish refrigeration experts, with the aim of making it possible to preserve and transport surpluses of agricultural products, fish, fruit, and so on. It will also enable remote districts to be supplied more easily with perishable food. The plant was used first at the end of July during the strawberry season at Finnerödja, western Sweden, a district producing 2,000,000 litres of strawberries in two to three harvesting weeks.

The train is the outcome of collaboration between the Swedish State Railways, the STAL freezing plant specialists, and the Helsingborg Cold Storage Company, whose director put forward the idea only some six months ago. The State Railways welcomed it and the scheme was begun without delay. The train consists at present of one machinery wagon, two refrigerator vans, and a fuel and material van. In the machinery wagon, equipped with a complete refrigerator plant, the air is cooled down to −35° C. (−31° F.) and is then fanned into the refrigerator van, loaded with perishable goods. When the products have been frozen to −35° C., the wagon is released and hauled by ordinary train to a cold storage plant, where the goods remain until distributed to retailers or exported. By means of cold-accumulators and careful insulation of the wagons a temperature of −30° C. is maintained for twenty hours in a normal outside temperature of +20° C. (68° F.). As soon as one of the refrigerator units has been disconnected from the machinery wagon the next one is connected to it, and a new load of perishables is frozen.

Power is supplied by a Scania-Vabis 8-cyl. diesel engine. The freezing machinery, constructed by STAL, includes one 9-cyl. low-pressure compressor and one 3-cyl. high-pressure compressor. Ammonia is the freezing medium. Some 400 kg. (882 lb.) of products may be frozen an hour, or nearly ten tons a day. The cold air is conducted from the evaporator, which consists of a gilled radiator with a total surface of 837 sq. m. (8,500 sq. ft.), by means of an SF ventilator with a capacity of 50,000 cu. m. (1,765,000 cu. ft.) of air an hour.

The roof, floor, and walls are about 250 mm. (10 in.) thick and are insulated with Swedish Isoflex foils, a product which in recent years has been in widespread use for refrigerator plants throughout the world. The cold accumulators in the transport wagons consist of 20 plates in which an eutectic solution is frozen.



Swedish State Railways "Thermo Train" consisting of two refrigerator vans with machinery, fuel, and materials services

CLOSING OF ROTHERHAM WESTGATE STATION.—On and from October 6, Rotherham Westgate Station, Eastern Region, will be closed to passenger and freight train traffic, with consequent alterations to the passenger train service shown in the timetable dated September 15. Alternative facilities for parcels traffic are available at Rotherham Masborough and Rotherham Central. Goods and coal traffic now dealt with at Rotherham Westgate will be dealt with at Rotherham Central.

Heavy-Duty Facing Machine

Designed for the use of tungsten carbide tools and with simplified controls

A SPECIAL - PURPOSE facing machine has recently been designed and manufactured by Kitchen & Wade Limited, a feature of which is simplicity of controls, designed with a view to minimise maintenance costs, and the use of less skilled operators.

The bed is of considerable depth and of box section design well ribbed internally. The table slideways are accurately machined and completely covered between the facing head and the table in any position. Sloping exit chutes for swarf are embodied in the design.

Table and Controls

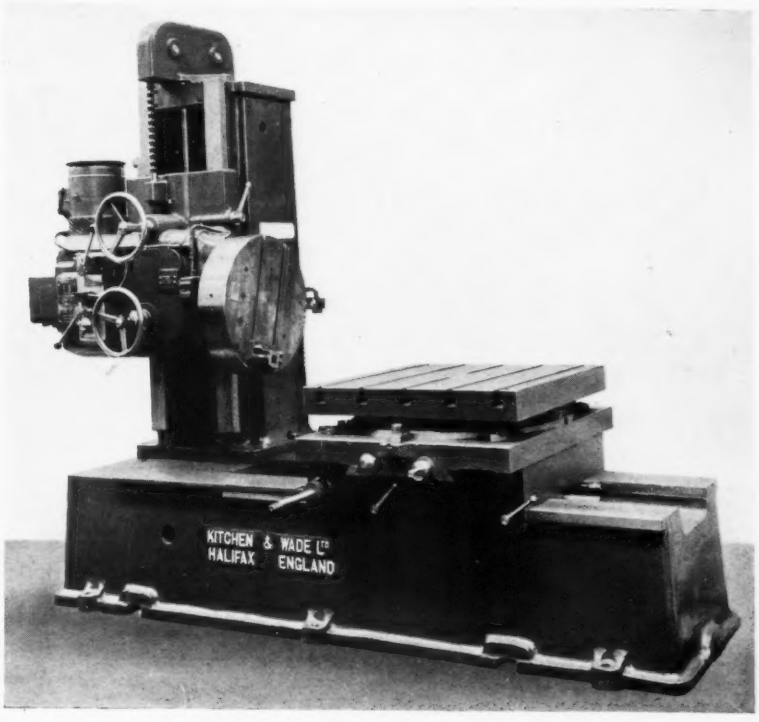
The table is of the compound type with quick traverse screws. Cross and longitudinal traverse controls are located at the front of the table for ease of operation. The work table is 3 ft. square with five machined tee slots. Four accurately indexed 90 deg. positions are provided, while a jacking device is arranged to break the joint permitting the table to revolve freely on ball bearings; a locking device is provided.

The column is of cast iron, bolted and dowelled to the machine bed and houses the balance weight: The head encloses all running mechanism and also the 5 h.p. a.c. driving motor which provides two speeds to the facing head in series ranging from 50 to 15 r.p.m. and power feed to the tool slide by nickel chrome steel gears, mounted on multi-splined shafts, ball bearing mounted. Automatic lubrication is provided by a built-in pump.

The facing head, 24 in. diameter, is mounted on a large diameter spindle and carries the facing slide which is fed by a power-operated enclosed mechanism. The spindle is mounted at the working end in a forced-lubricated phosphor bronze bearing, and a ball journal bearing at the rear end.

The facing slide is of Meehanite cast iron, and is provided with two tee slots for alternative tool positions; the facing slide operates in each direction. The machine faces up to 24 in. dia. under heavy duty conditions, or alternately up to 30 in. dia. under medium cutting duty. Power feed traverse of the table towards the facing head, up to 800 ft. per min. can be provided at additional cost. The facing feed is either $\frac{1}{32}$ in. or $\frac{1}{4}$ in. per revolution.

Push button "stop" and "start" is provided, and all working slides are arranged with adjusting wedges for taking up wear.



Kitchen & Wade special-purpose facing machine.

LONDON—SCOTLAND ROAD SERVICES.—Permission was given on September 2 to Northern Roadways Limited to present its case to justify operating a fleet of luxury buses to London, Birmingham, and Scarborough. The present hearings concern Glasgow—London and Edinburgh—London routes. Application for the Glasgow to Scarborough and Glasgow to Birmingham routes will be heard during the next fortnight.

L.M.R. FIRST AID AWARDS.—For skill in rendering first aid to seriously injured colleagues and members of the public, nine members of the London Midland Region, including a driver, signalman, ganger, yard inspector and goods clerk, have each been presented with a clock or certificate of merit. Mr. J. W. Watkins, Chief Regional Officer, made the presentations in his office at Euston on August 29. The driver's award was for rendering first aid to a man who had fallen on to the main line from a railway bridge, having stopped his engine on hearing news of the accident. The signalman, called to the assistance of a colleague very badly injured by a shunting engine, acted so efficiently and expeditiously that the patient was treated and transferred to an ambulance in 7 min. The yard inspector was called when an army corporal fell from a train in motion, and enlisting the aid of a bystander who had no knowledge of ambulance work, successfully dealt with a severe haemorrhage.

L.T.E. FARES ADJUSTMENTS.—The London Passengers' Association, in a statement on September 1, said that because of "the practice of the London Transport Executive chopping and changing bus crews from one route to another, much of the charging is pure guesswork by conductors unfamiliar with the road on which they are working." Suggestions were made for the availability of leaflets and fare boards in larger type in buses and on trains. A reply from London Transport denied that bus crews were changed frequently, it being normal practice for a crew to remain on a route for several months, or even years. Details of the revised fares which came into force on August 31 were issued to the staff on August 8 and individual fare tables on August 13, allowing roughly three weeks to study them.

LEVEL CROSSING ACCIDENT IN JAMAICA.—On August 31 seventeen persons riding in a lorry were killed when the lorry was struck by a train on the Jamaica Government Railway at a level crossing forty miles from Kingston.

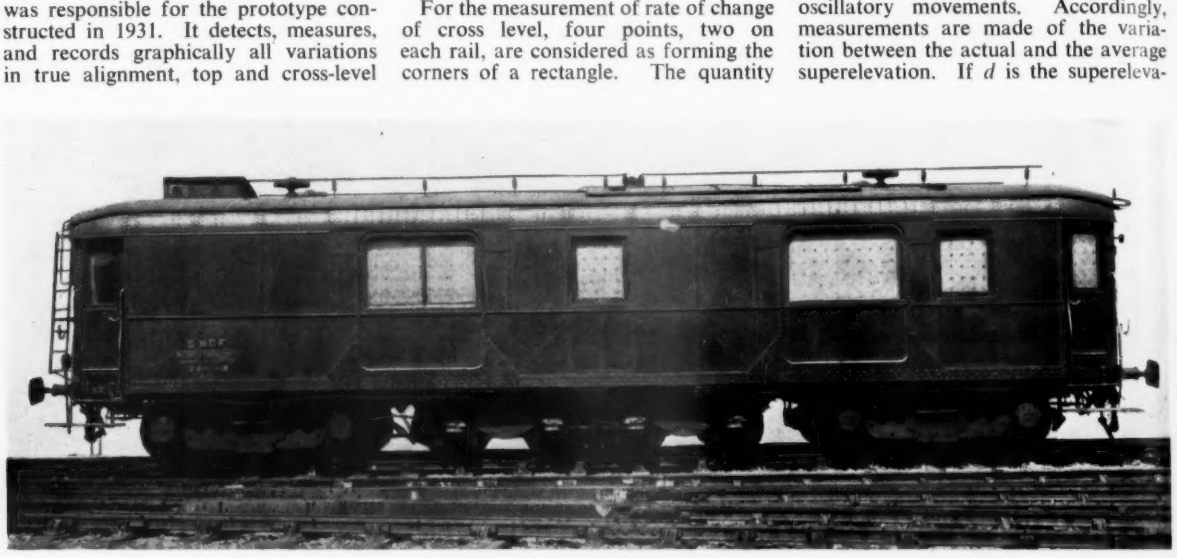
INTERNATIONAL RAILWAY TEMPERANCE UNION.—The International Railway Temperance Union annual congress is being held this year in London from September 12 to 17. The British Railways Temperance Union will welcome some 400 delegates from 10 countries. The principal congress meeting will be held at Friends House, Euston Road, London, N.W.1, today, September 12. The year's President of the British Railways Temperance Union is Mr. C. K. Bird, Chief Regional Officer, Eastern Region.

XUM

Mauzin Track Inspection Car

Records of track condition obtained by specially equipped coach running in ordinary trains

DEVELOPMENTS in track-recording apparatus are being closely followed by British Railways, and among new equipment being studied is the Matisa-Mauzin inspection car. This vehicle was designed by Monsieur M. Mauzin, Chef de la Section des Essais et Recherches Traction-Voie, S.N.C.F., who was responsible for the prototype constructed in 1931. It detects, measures, and records graphically all variations in true alignment, top and cross-level and curvature of the running rails under loaded conditions.



General view of inspection car

The French National Railways have built three of these cars; two are in constant use in France and the third works regularly outside France, in Belgium, Holland, Austria, Denmark and Sweden. The use of the vehicle in these and other countries is in the hands of Matériel Industriel, S.A., of Lausanne, whose associate in the United Kingdom and Commonwealth is Matisa Equipment Limited, London.

The equipment consists of a special eight-wheel bogie, situated midway between the normal running four-wheel bogies of the vehicle and sharing equally the weight of the vehicle. Thus a total of 16 wheels is available to form a reference plane and detect all vertical variation. Similarly, six disc-mounted feeler shoes which follow the contour of the running edge of the rail reveal any lateral displacement of the track.

The reactions of these two reference planes are transmitted to a series of stylos on the instrument table, mechanically connected to the axles of the special bogie by compensating beams and tensioned cables, where they record the reaction of the axles on a moving band of paper geared to feed at a rate proportional to the distance travelled by the car.

Recordings are made in the vertical and horizontal planes, as follows:—1. *Vertical Plane.* (Top.) (*a*) Rate of change of cross-level, (*b*) Vertical irregularities on each line of rails, (*c*) Variation of cant. 2. *Horizontal Plane.* (Alignment.) (*a*) Versines of each line of rails, (*b*) Gauge.

For the measurement of rate of change of cross level, four points, two on each rail, are considered as forming the corners of a rectangle. The quantity measured is the vertical distance from any corner to the plane formed by the other three. This measurement is made on a base line of 2.75 m. but is recorded full size in millimetres per meter. Reference lines drawn on the chart 4 mm. on each side of a zero line enable the extent of the variation to be appreciated at a glance.

Detecting Vertical Irregularities

Vertical irregularities on each line of rails are detected by recording the difference between the height of one wheel and the average height of all eight wheels on that side of the vehicle. If a is the actual magnitude of deviation, the quantity recorded is $a-\Sigma\frac{a}{8}$. The distance over which the average height is measured is the full wheelbase of 12.2 m. Similar recordings are made on each line of rails. The quantity $a-\Sigma\frac{a}{8}$ is shown full size on the graph and is related to a reference line drawn 10 mm. below the zero line to give an immediate indication of its extent.

Originally, cant was measured as an absolute quantity, but this practice has been given up for the following reasons.

Experience in France has shown that a vehicle is little affected by a continuous excess or deficiency of superelevation. On the other hand, if there is a periodical change of superelevation (at intervals of about 13 to 30 metres), the effect on vehicles is severe because of possible resonances between the track irregularities and their own oscillatory movements. Accordingly, measurements are made of the variation between the actual and the average superelevation. If d is the superelevation at one part of the track, the quantity recorded, $d-\Sigma\frac{d}{8}$, is shown to full scale. Reference lines drawn 5 mm. on each side of the zero provide a rapid means of assessing the importance of the variation.

Alignment is determined from versines which are measured on each line of rails over a 10 m. chord by means of three disc-mounted feeler shoes bearing laterally against the rails. The discs are at equal spacing and the distance between centres of the two outer ones is 10 m.

Deflections are recorded full scale on the chart. On track where side cutting of rails has taken place the resulting increase in gauge is recorded, which is not always so when portable instruments are used for this measurement. Reference lines are drawn on the chart 3.5 mm. on each side of the zero; this value is the maximum deflection met with on good track.

Gauge is measured by two disc feeler shoes bearing on opposite rails at two points on a line at right angles to the centre line of the track. Variations are measured full scale.

Each recording band is headed with the measurements to be registered and their scales. All measurements are in-

dependent of speed up to 85 m.p.h. Recording charts are run at the rate of either 20 cm. or 1 m. per kilometre, according to the distance being covered. At the same time the previous recording is run to allow comparison.

Interpretation of Records

An inspection coach is accompanied on its journeys by a district engineer and a representative of the permanent way staff responsible for the section. Records are discussed, interpreted and compared with previous recordings during each trip. When the district engineer has examined the Mauzin charts for his district he decides, from the available labour, which sections shall receive priority.

Action is taken in accordance with indications readily deduced from the charts, which facilitate the following:—

(1) Assessment of the state of the track;

(2) Planning of maintenance and partial renewal programmes;

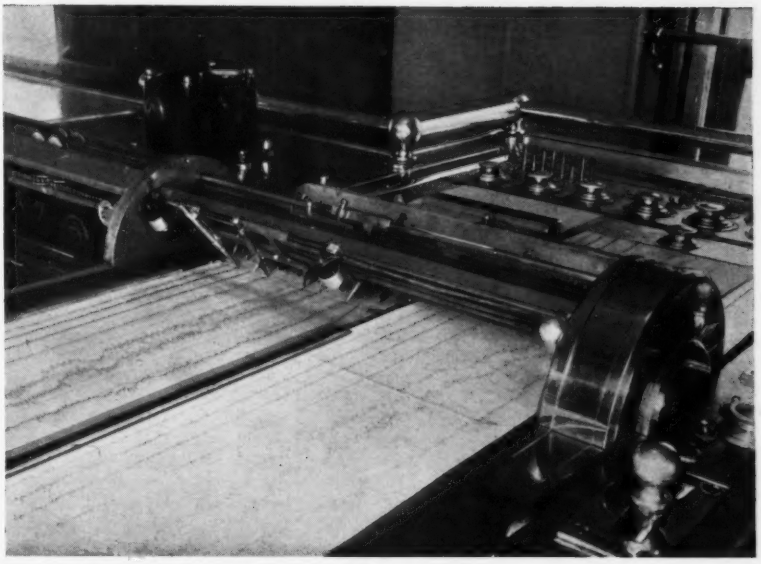
(3) Assessment of the capacity and keenness of staff;

(4) Investigation of the fitness of permanent way material and observing the effect of improvements.

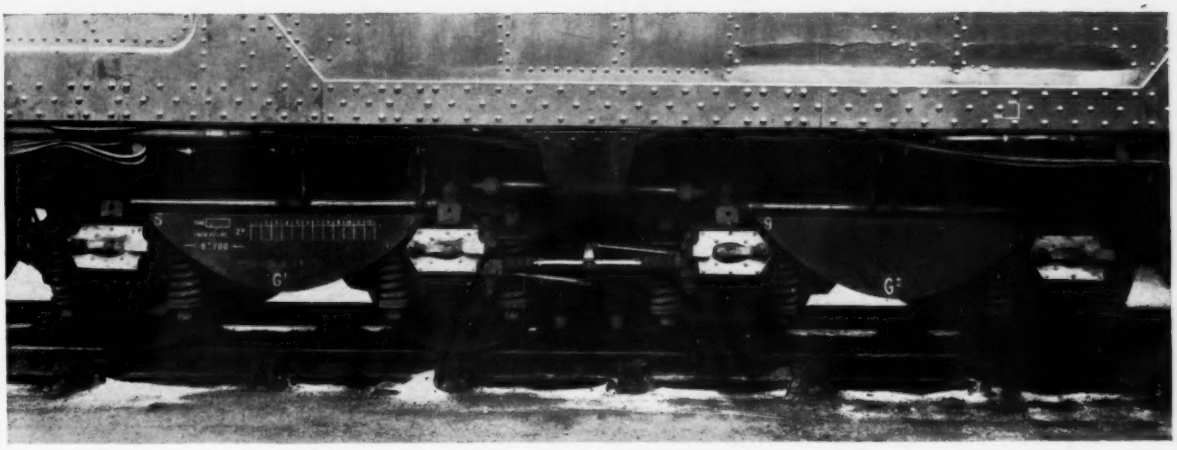
Study of successive records shows up; (*a*) Lengths where the desired standard is maintained by normal measures, and (*b*) lengths where this standard is difficult to maintain.

Case (*b*) obviously warrants on-site examination and the appropriate remedy, ordinary maintenance in such circumstances being a recurrent expense that should be reduced. With few and localised exceptions, the charts point clearly to age and fatigue of track components if the effect of maintenance at the normal regular intervals is seen not to be lasting. Justification is given therefore for renewals or for certain temporary expedients such as packing under rail joints, fitting new fishplates, local administrative measures, and so on. Loose fishplates show up clearly on the charts by causing deflection of rails at joints, which is revealed on the gauge record. Other faults in the same category are generally well known.

Confirmation that maintenance work has been effective is given readily by the records, because each line of rails is charted individually. The records



Moving bands on which recordings are made



Close-up of eight-wheel bogie which detects track irregularities

Section of record showing representation of different conditions of track

enable the value of improvements to be judged, and the reasons for unsatisfactory results to be deduced.

Maintenance and renewal programmes of the appropriate standards for all lines are planned on the basis of the chart records. Two examples of opposed requirements may be considered, one being a scheme for so-called *voies co-ordonnées* (those reserved for low-speed goods traffic) and the other one for main routes.

On the slow goods lines it is sufficient to correct cross level and gauge at places where the charts show that the permissible limits under load are being exceeded. In this way the charts are a guide to the whereabouts of faulty sleepers and fastenings.

On main lines the aim must be quality. Three main types of records may be obtained, of which the characteristics are as follows:—

(1) The condition of the permanent way is revealed as excellent. Where the standard of maintenance is uniformly high, work (other than replacements) can often be deferred because there has been no deterioration between inspections. The only faults showing on the chart are at a few isolated spots, such as level crossings or steel bridges. Such irregularities in the graphs are usually caused by faults in levelling and packing, alignment, and gauge, resulting from faulty sleepers or longitudinals. Such conditions appear clearly on the charts as a rapid increase in gauge. The necessary corrective measures are taken at these readily identifiable points.

(2) Low spots are shown only at rail joints. It is at the joints that any decline in the standard of the track appears first, and this is always shown clearly on the charts. On the S.N.C.F., correction of level is made only at joints, a procedure justified by the substantial economies secured.

(3) Consistent variations from normal are recorded over an appreciable distance and are large enough to justify attention to the section in question.

The type of feeler-shoe used for detecting lateral deflection and gauge indicates the condition of the track components (accuracy of seating on each line of rails, level, gauge within the limits of the vehicle, and, in particular, excess gauge.

Economies are effected on all lines by restricting maintenance to features in need of it, and at the same time the general standard of permanent way is improved, particularly on secondary lines.

The following operations, additional to the general maintenance programme, may be undertaken as special measures if the prescribed limits are reached:—

(*a*) Correction of wide gauge and faults in cross level. In this way numerous places on slow goods lines that have reached their limits under load have been detected (sleepers needing replacement, wear of rails on small radius curves).

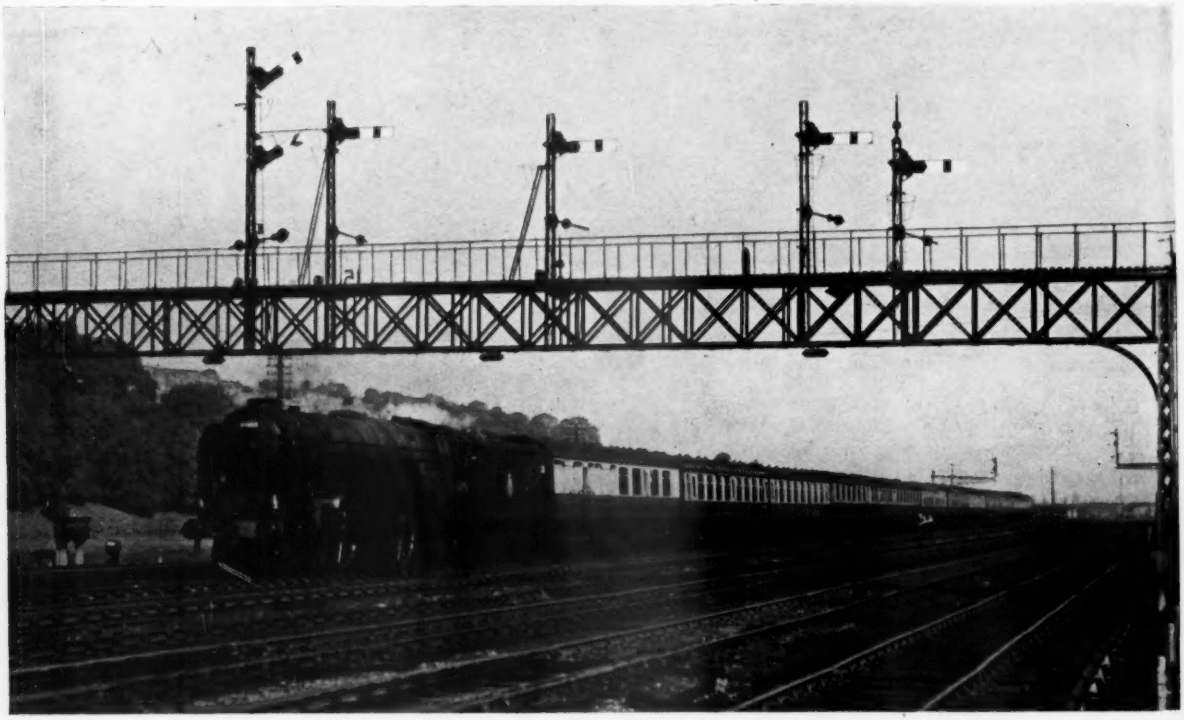
(*b*) Inspection of permanent way components (irregularities of level in the horizontal and vertical planes, packing, gauge variations, and so on).

(*c*) Isolated features, particularly level crossings and steel bridges (checking of level, correct seating of rails, and gauge). A rapid widening of gauge observed in successive recordings indicates probable poor condition of sleepers or longitudinals.

Value of Records

The records give credit to the work of efficient staff and enable shortcomings in supervision to be detected and remedied. There has been a resulting increase of competitive spirit among supervisory grades in many instances. An important feature of the records is the opportunity they afford of comparing the effectiveness of components on the basis of a given period of service and number of maintenance operators. Such comparisons, for example, have enabled the Belgian National Railways to standardise working methods and to confirm the value of a particular type of fishplate.

The Up "Northumbrian," North Eastern Region



The up "Northumbrian" from Newcastle to Kings Cross, hauled by class "A1" locomotive No. 60158, "Aberdonian," passing Ferryhill, County Durham

Realignment for Flood Control near Peoria

Special measures on Toledo, Peoria & Western Railroad to pass high-level streams under track in cutting

First train passing over realigned section of Toledo, Peoria & Western Railroad near East Peoria

THE United States Government is protecting East Peoria, Illinois, from the threat of flooding by controlling streams debouching from the hills to the east of the city. Dams are being constructed across two creeks specially liable to come down in spate. As the Toledo, Peoria & Western Railroad closely follows one, Farm Creek, through broken country, its former alignment is liable to inundation by the lake formed by the dam, designed to hold up water from a 26-sq. mile catchment area. The Federal Government has therefore had to divert the line, 4½ miles of new construction being involved. Though the new and old alignments are practically equal in length, the former has 39 deg. less central curvature, its sharpest curve is 58-ch. radius as against 29-ch. previously, and the ruling gradient is eased from 1 in 100 to 1 in 120.

Principal Earthworks

The principal earthworks involved are two cuttings, one 1½ miles long and 85 ft. deep, and the two together necessitating 2,200,000 cu. yd. excavation; embankments up to 40 ft. in height were also required. Formation width is 22 ft. in both cutting and bank; the side slopes are 1½ to 1 and 2 to 1 respectively. The principal items of earth-handling plant used were 13½-cu. yd. carriers loaded by 3-cu. yd. draglines, 15-cu. yd. scrapers, and a number of bulldozers and sheepsfoot rollers. The fills were thrown up in 6-in. layers each consolidated with the sheepsfoot rollers.

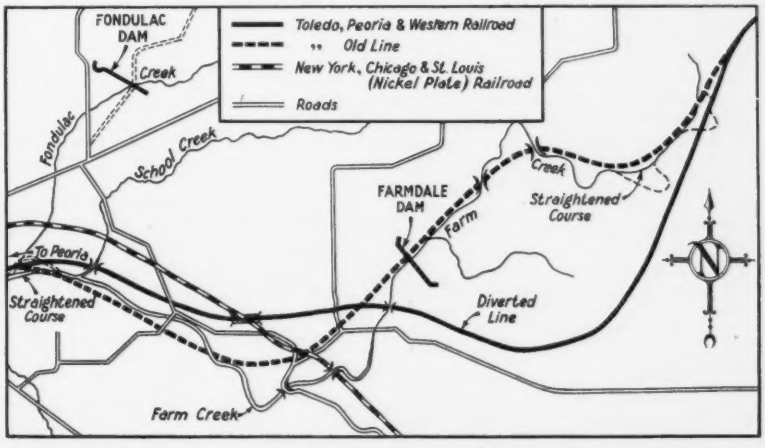
The construction of the larger cutting was complicated by the necessity to excavate to depths considerably below the beds of two cross tributaries of Farm Creek. To pass their discharge in flood two unusual culverts were built, in the form of inclined open flumes, with a reinforced concrete trough-shaped slab to carry the track. Both culverts or flumes have flared inlets, and their side walls are sufficiently high to be well above the flow lines of the culverts, and the headwalls or sides of the troughs are carried up to the same height.

One of the culverts is built on a 55-deg. skew and has a width of 15 ft.; the headroom under the trough is 6 ft. The slope approaching the track is 1 in 3 with vertical curves, and that under it is 1 in 100. The cutting side drainage intercepted by this culvert on the upstream side of the line is passed through an opening in the side wall of the flume, but that on the downstream side is diverted in a paved ditch into the culvert outflow channel, which involved 500 lin. ft. of excavation.

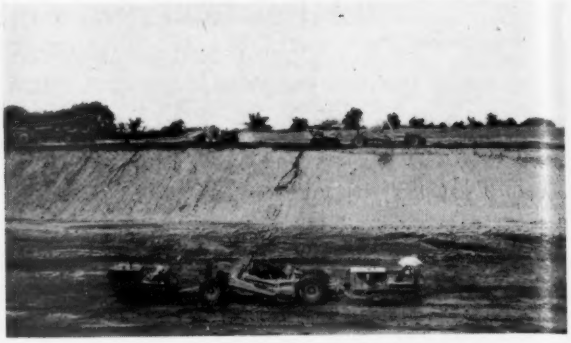
The other culvert is at right angles to the line, and instead of having a 9-ft. fall like the culvert above, it drops 14 ft. 6 in. in 44 ft., and the slope under the track is 1 in 200. The opening here is only 6 ft. wide and the headroom is 5 ft. Cutting drainage is caught in two sumps, one on each side of the track, connected by a 2-ft. 6-in. corrugated iron pipe. Beyond the downstream sump a 3-ft. 6-in. pipe carries off the water into the culvert outflow; there is an automatic drainage gate at the discharge end of this pipe. The outflow channel from this culvert was excavated for 1,050 ft.

Special Drains Protect Cuttings

Catchwater drains were dug along the tops of the cuttings where necessary to prevent the erosion of their slopes. Where the outflow from these drains could not be carried away from the cutting, it was led in paved flumes down the slope. The upper ends of these flumes—like the culvert flumes—were protected from undermining by steel sheet piling drop walls. At the lower ends, concrete landings were provided with foundations below the frost line, to stabilise the flumes and prevent their being undermined. To ensure that the track and its side drains are not damaged by scour from these catchment flumes, concrete walls with overhanging



Sketch map showing old and new alignments near East Peoria



(Left) Bulldozer shaping side-slope of deep cutting, and (right) heavy earth-moving plant in the cutting

lips were constructed on the track side of the stabilisers.

To keep traffic flowing during construction without interruption, two short temporary diversions were necessary, so that (*a*) Farm Creek could be straightened and its crossing at two points eliminated by both old and new alignments, and (*b*) the gap where the new line crosses over the old alignment could be filled. Also the new line passes over the New York Central & St. Louis (Nickel Plate) Railroad on a 60-deg. skew bridge on a 43½-ch. curve. The structure is 322 ft. long, consisting of four 41 ft. 4 in., two 35 ft. 6in., one 42 ft. and one 43 ft. steel spans carried on concrete piers and abutments founded on *in situ*-cast concrete piles. We are indebted to the Toledo, Peoria & Western Railroad for details of the projects and the illustrations reproduced.

Freight train traversing cutting on new line

Transductor Control for Lighting Circuits

System applicable to a.c. electric stock

WHEN power collected on an electric locomotive or motor coach is used for train lighting, the alternatives are to group lamps in series across the supply or to feed them from a low-voltage source, usually emanating from a rotary machine. The latter method, in conjunction with a battery on floating charge able to provide an emergency supply to the lamps, is generally preferred today. On a.c. stock the necessary d.c. can be provided economically by a rectifier if the load is not heavy.

An equipment developed in Sweden by A.S.E.A. uses a transductor to control the charging current to the battery. The a.c. winding is in series with the 16⅔-cycle input to the rectifier, taken from the train heating circuit. There are two d.c. windings, one in series with the rectifier output and the other a shunt winding across the load circuit, in which voltage variations due to the different states of charge of the battery are smoothed out as far as possible by a carbon pile voltage regulator. Consequently the current in the second winding is substantially constant and serves to control the battery charging current irrespective of supply voltage variations.

A further cause of changes in charging current would be alterations in load due to lamps being switched on and off, which might retard restoration of battery voltage after a heavy discharge. These are counteracted by the winding in series with the rectifier output, which reduces the impedance of the transductor with an increase of the lighting load current.

An ampère-hour meter is arranged to open contacts in the shunt winding circuit when the battery is fully charged. This places resistance in circuit and reduces the current in the winding so that there is an increase in the transductor impedance and a lower charging rate to the battery.

An equipment of this type was illustrated in a recent issue of *Electric Traction on the Railways* (published by the International Railway Congress Association) in the course of an article dealing with various applications of the transductor in railway service. In this example the transductor, rectifier, and transformer providing the 16⅔-cycle input at suitable voltage from the train heating mains are contained in a tank filled with cooling oil under the motor coach.

RAILWAY NEWS SECTION

PERSONAL

Field-Marshal Sir William Slim, Chief of the Imperial General Staff, whose appointment as Governor General of Australia has been announced, was Deputy Chairman of the Railway Executive between 1947-48.

Mr. K. A. Fraser, O.B.E., A.M.I.E. (Aust.), M.Inst.T., Commissioner for Railways, New South Wales, whose death was recorded in our issue of September 5, was born in 1893 and entered the Department of Railways in 1911 as a cadet, and gained experience on deviation and duplication works. In January, 1915, he enlisted and served three years in France with 12 Field Company (Engineers) as Lieutenant. In 1922 he was appointed Resident Engineer for the Sydney Underground Railway and supervised the construction of the four existing underground stations. After a period as Resident Engineer, Maintenance, he was appointed, in 1938, Supervising Engineer, Construction, to begin work on the new Hawkesbury River Bridge. In May, 1940, he enlisted in the 2nd A.I.F. and was appointed to command the Railway Construction Group overseas; the Group carried out important railway work in the Middle East, including construction in a remarkably short time of the Beirut-Tripoli line. For the part he played Mr. Fraser was awarded the O.B.E., and mentioned in despatches. On his return to the Railways Department in 1943 he supervised all construction work. In 1945 he was appointed Assistant Chief Civil Engineer, Construction, and in 1946 he became Deputy Chief Civil Engineer. Later he was transferred to the Transport & Highways Commission as Chief Engineer. He became Chief Civil Engineer, N.S.W. Government Railways, in November, 1950. In February, 1952, Mr. Fraser was appointed Commissioner for Railways, New South Wales. He was a Member of the New South Wales Centre of the Institute of Transport.

The late Mr. K. A. Fraser
Commissioner for Railways,
New South Wales

Mr. Reginald Winsor
Appointed Commissioner for Railways,
New South Wales

Mr. A. E. L. Jervis has been appointed Trade & Technical Press Officer of the English Electric Co. Ltd.

SOUTHERN REGION APPOINTMENTS

The following appointments are announced in the Southern Region of British Railways:—

Mr. J. R. Turk, General Assistant, Accountants' Department, Deepdene, to be Assistant to Accountant, in place of Mr. W. H. Appleton, retired.

Mr. W. H. Owen, Assistant to District Engineer, Brighton, to be Assistant District Engineer, Woking, in place of Mr. K. S. Martin, appointed to the London Midland Region.

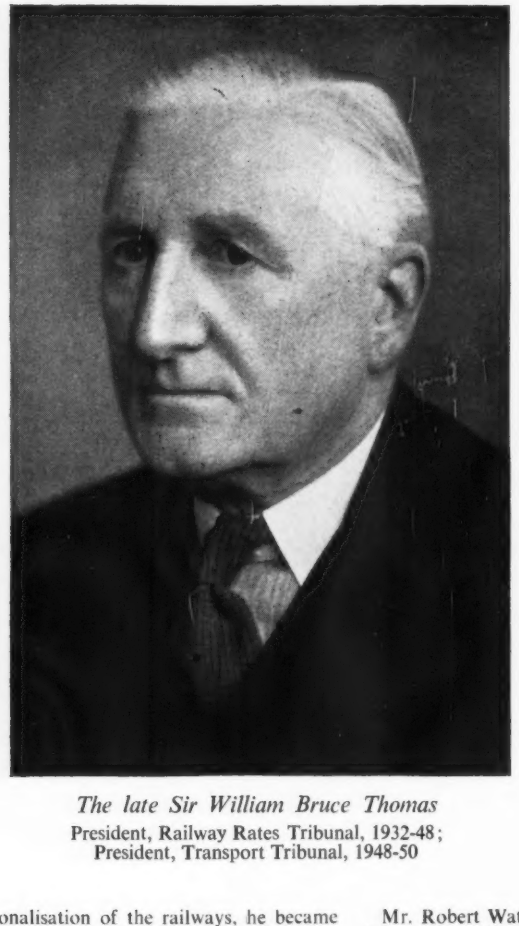
Mr. T. E. Jackson, Assistant to Commercial Superintendent (Claims), London Midland Region, to be District Goods Superintendent, London Bridge.

Mr. Reginald Winsor, Director of Transport & Highways, New South Wales, who, as recorded in our issue of September 5, has been appointed Commissioner for Railways, entered the service of the New South Wales Department of Railways as a probationer in 1906, and subsequently occupied various posts in the Traffic and Mechanical branches. In 1942, he was appointed Chief Staff Superintendent, and in 1948 Assistant Commissioner for Railways. Mr. Winsor became Commissioner for Road Transport & Tramways in 1949, and Director of Transport & Highways on establishment of the Transport & Highways Commission in 1950. Between 1931 and 1940 he was President of the Railway & Tramway Officers' Association (now the Australasian Transport Officers' Association).

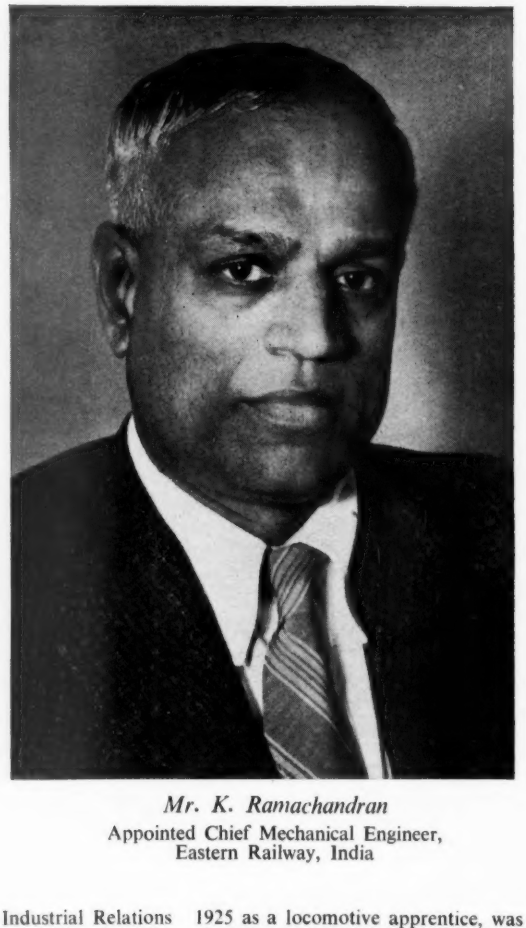
We regret to record the death of Mr. C. A. Gillam, a Director of Tilling-Stevens Limited.

A luncheon recently was given to some 15 former officers of the Great Western Railway, whose ages ranged upward to 87, to congratulate Mr. F. C. Warren on reaching his 80th birthday. Mr. Warren was formerly the principal member of the staff of the Chief Civil Engineer and was at one time Secretary to Sir James C. Inglis. The luncheon was one of several of this type given by Sir Felix J. C. Pole, General Manager of the G.W.R. from 1921 to 1929.

We regret to record the death on September 5 of Sir William Bruce Thomas, Q.C., President of the Railway Rates Tribunal, 1932-48, and President, Transport Tribunal, 1948-50. He was born in 1878, and called to the Bar in January, 1912. He was a Member and Bencher of the Middle Temple and took Silk in 1928. He had a long experience at the Parliamentary Bar and practised before the Rates Advisory Committee, the Railway and Canal Commission and the Railway Rates Tribunal, previous to his appointment as President of the Railway Rates Tribunal in 1932. After nationalisation of the railways, he became President of the Transport Tribunal, which, under the provisions of the Transport Act, 1947, superseded the Railway Rates Tribunal. When, at the request of the Minister of Transport, the Rates Advisory Committee undertook the examination of the rates and charges structure of the railways, which resulted in the recommendations on which Part III of the Railways Act, 1921, was largely based, he appeared with Sir John Simon, Sir Lynden Macassey, and the late Mr. F. T. Barrington Ward for the railway companies. He was also engaged in the preparation and presentation of many amalgamation schemes before the Railway Amalgamation Tribunal. In the interest of the Railways, he took a prominent part in the proceedings connected with the revision of railway rates and charges following the passing of the Railways Act. As President of the Railway Rates Tribunal, he was Chairman of the Charges (Railway Control) Consultative Committee of 1940, which was set up under the agreement between the Government and the undertakings controlled by the Railway Executive Committee to advise the Minister of Transport on the adjustment of charges to produce the revenues required to meet extra wartime expenditure. He was also Chairman of the Charges Consultative Committee which advised the Minister on the applications for certain increases in charges in 1946, and in January of 1950. He received the honour of knighthood in 1941. Sir Bruce Thomas's appointment as President of Transport Tribunal expired on December 31, 1950.



The late Sir William Bruce Thomas
President, Railway Rates Tribunal, 1932-48;
President, Transport Tribunal, 1948-50



Mr. K. Ramachandran
Appointed Chief Mechanical Engineer,
Eastern Railway, India

Mr. Robert Watson, Industrial Relations Officer, Road Haulage Executive, is severing his connection with the Executive as from October 1.

Mr. Edward Infield Willis has been appointed a Director of Southdown Motor Services Limited in the place of the late Mr. A. E. Cannon.

The Institution of Civil Engineers announces awards for students' papers read during the 1951-52 session before Local Associations and the Association of London Students. The James Forrest Medal and a Miller Prize have been awarded to Mr. F. G. Johnson for his paper "The River Dee as a Source of Water Supply for the Wirral Peninsula" (North-Western Association). Miller Prizes have been won by ten students, including Mr. Arthur Marsland, of the Association of London Students, author of a paper "The Use of Scale Models in Civil Engineering."

Mr. E. W. Burke, New Works Assistant, Rhodesia Railways, has retired.

We regret to record the death on August 25 of Mr. John McCann, a former Director of Coras Iompair Eireann.

Mr. K. Ramachandran, M.E. A.M.I. Loco.E., formerly Chief Mechanical Engineer, Bengal Nagpur Railway, who, as recorded in our May 23 issue, has been appointed Chief Mechanical Engineer, Eastern Railway, India, was born in 1903. He joined the Bengal Nagpur Railway in 1925 as a locomotive apprentice, was promoted a locomotive probationer in 1930 and two years later was confirmed as an Assistant Locomotive & Carriage Superintendent. Mr. Ramachandran came to England in February, 1934, and returned to India in June of that year. In 1942 he was promoted District Locomotive & Carriage Superintendent and was confirmed in that post in October, 1943. He became Deputy Chief Mechanical Engineer (Equipment) in March, 1947, and in September of the same year his services were placed at the disposal of the Railway Board, where he was posted on special duty in the rank of a Chief Mechanical Engineer. While on special duty he served as a member of the three-man classification tribunal set up in 1948 to classify skilled workers in connection with the recommendations of the Central Pay Commission. On release from the Board Mr. Ramachandran was posted as the Chief Mechanical Engineer, Bengal Nagpur Railway.

Largest Beyer-Garratt Locomotives on View

Inspection at Gorton Works of motive power for New South Wales Government Railways

On Thursday, September 4, Mr. Harold Wilmot, Chairman & Managing Director, and the directors of Beyer Peacock & Co. Ltd., invited a number of prominent persons associated with transport to Gorton Works to see some of the Beyer-Garratt locomotives which the company is building for the New South Wales Government Railways.

Among those present were:—

Mr. F. W. Abraham, Motive Power Superintendent, London Midland Region; Brigadier P. K. Benner, Ministry of Supply (D.R.E.E.);

Messrs. A. Campbell, Chief Mechanical Engineer, Crown Agents for the Colonies; K. Cantlie, Locomotive Manufacturers' Association; K. J. Cook, Mechanical & Electrical Engineer, Eastern Region; B. W. C. Cooke, Editor, *The Railway Gazette*; E. S. Cox, Executive Officer (Design), the Railway Executive; M. A. Crane, Assistant to Sales Director, Beyer Peacock & Co. Ltd.; C. R. Culling, Messrs. Price, Waterhouse and Company; J. Crowther, Chief Accountant, Beyer Peacock & Co. Ltd.; Dr. C. J. Dadswell, English Steel Corporation Limited; Messrs. L. T. Dawes, Secretary & Commercial Manager, Beyer Peacock & Co. Ltd.; F. O. Ellis, Rede Ferroviaria do Nordeste.

Messrs. A. L. Fielding, New South Wales Government Railways; A. Fleming, Iron & Steel Control; B. Fowler, Assistant Chief Draughtsman, Beyer Peacock & Co. Ltd.; A. H. Greenham, Acting Agent-General for South Australia; J. Hadfield, Technical Manager, Beyer Peacock & Co. Ltd.; G. T. Hart, Secretary, Institution of Locomotive Engineers; J. H. P. Hawtry, Crown Agents for the Colonies; A. Henderson, Messrs. Livesey & Henderson; H. Holden, Cashier, Beyer Peacock & Co. Ltd.; F. S. Hudson, New South Wales Government Railways.

Messrs. D. R. Lamb, Editor, *Modern Transport*; J. D. Lewis, Messrs. Fox & Mayo; S. E. Lord, Messrs. Rendel, Palmer & Tritton; O. S. Naylor, Rhodesia Railways; D. Patrick, Design Superintendent, Beyer Peacock & Co. Ltd.; W. N. Pellow, Motive Power Superintendent, Western Region; F. A. Pope, Member, British Transport Commission; W. G. W. Reid, Consultant, India Stores Department; R. A. Riddles, Member, Railway Executive; T. Rothwell, Chief Draughtsman, Beyer Peacock & Co. Ltd.

Messrs. C. E. R. Sherrington, British Transport Commission; H. H. Thackstone, the Midland Bank Limited; Charles P. Whitehead, General Steel Castings Corporation; F. Wilde, Works Superintendent, Beyer Peacock & Co. Ltd.; H. A. Wilkinson, Steel, Peech & Tozer Limited; W. Cyril Williams, Sales Director, Beyer Peacock & Co. Ltd.; H. Wilmot, Chairman & Managing Director, Beyer Peacock & Co. Ltd.; H. Woodward, Houldsworth & Co. Ltd.

Two of the 4-8-4 + 4-8-4 locomotives, which were fully described and illustrated in *The Railway Gazette* of July 4 last, were on view at the works. One of them was in steam. The locomotives, which weigh some 255 tons and measure 108 ft. 7 in. over buffers, rank as the most powerful engines built in Europe. Because of their comparatively low axle load—16 tons—these locomotives will be able to operate over practically the whole of the New South Wales 4 ft. 8½ in. gauge system. An order has been placed with Beyer Peacock & Co. Ltd. for fifty locomotives of this type. The first has already gone into service, and reports from New South Wales speak highly of its performance.

The locomotives embody a number of interesting features which were fully described in our July 4 issue. Guests at the inspection were given copies of a reprint, with additional illustrations, of this article.

Mr. Wilmot, in welcoming the guests to the luncheon at the Midland Hotel, Manchester, before the visit to the works, said that the first section of the New South Wales Railways had been opened in 1855 and now included over 6,000 route-miles of standard-gauge line, which served a population of three millions. He stated that the company had supplied about 400 locomotives to the New South Wales railways between 1866 and 1914. Of these, 350 were still in service, many of them built in the 1870s. The first Garratt scheme, produced in 1908, was for New South Wales, although it was never built. These 50 huge new Beyer-Garratt locomotives for the New South Wales Government Railways were ordered without prototype. The system connected with the railways of Victoria at Albury, with those of Queensland at Brisbane, and with those of South Australia *via* Broken Hill.

He paid tribute to the team-work of members of the staff of Beyer Peacock & Co. Ltd., which had made their design and production possible. Mr. A. A. Greenham, Acting Agent General for South Australia, responded briefly.

During the visit to the works the guests were also shown one of the first articulated locomotives built by Beyer Peacock & Co. Ltd. for the Tasmanian Railways. This had been ordered in 1908, and had been bought back by the company in 1947. It was shipped to England and has now been repainted in its original colours.

International Machine Tool Exhibition

Display of British, American, and Continental machine tools and equipment

The Seventh Machine Tool Exhibition organised by the Machine Tool Trades Association, the President of which is Mr. Robert W. Asquith, will open at Olympia on September 17, and will remain open until October 4. The exhibition will occupy an area of some 500,000 sq. ft., and will consist of machine tools and ancilliary equipment of British, American, and Continental manufacture.

Many of the machines, automatics, centre lathes, milling, shaping, slotting, and drilling machines, gear hobbers and so on, will be demonstrated under actual production conditions; heat-treatment plant, and the latest types of measuring instruments will also be on exhibition. Demonstrations will be given of the use of special cutting steels. A list of manufacturers exhibiting appears below:—

Abwood Tool & Engineering Co. Ltd.; Acbars Limited; Adam Machine Tool Co. Ltd.; Adcock & Shipley Limited; Ajax Machine Tool Co. Ltd.; Geo. H. Alexander Machinery Limited; Edgar Allen & Co. Ltd.; Anglo Abrasive Works Limited; James Archdale & Co. Ltd.; W. & T. Avery, Limited.

E. P. Barrus (Concessionaires) Limited; J. E. Baty & Co. Ltd.; Benrath Machine Tools Limited; Benton & Stone Limited; Birlec Limited; Birmingham Tool & Gauge Co. Ltd.; E. W. Bliss (England) Limited; Brayshaw Furnaces & Tools Limited; Brett's Patent Lifter Co. Ltd.; S. N. Bridges & Co. Ltd.; British Engineers Small Tools & Equipment Co. Ltd.; British Ermeto Corporation Limited; British Indicators Limited; Brook Motors Limited; Brooke Tool Manufacturing Co. Ltd.; David Brown Machine Tools Limited; B.S.A. Tools Limited; Buck & Hickman Limited; F. Burnerd & Co. Ltd.; Burton, Griffiths & Co. Ltd.; Butler Machine Tool Co. Ltd.

Cardiff Lathe & Tool Works Limited; Carborundum Co. Ltd.; J. W. Carr & Co. Ltd.; Catmur Machine Tool Corporation Limited; Central Tool & Equipment Co. Ltd.; Charles Churchill & Co. Ltd.; Churchill Machine Tool Co. Ltd.; Churchill-Redman Limited; Cincinnati Milling Machines Limited; Clifton & Baird Limited; George Cohen Sons & Co. Ltd.; Crawford & Co. (Tottenham) Ltd.; Cunliffe & Croom Limited.

Stuart Davis Limited; Dawson Bros. Ltd.; Dean Smith & Grace Limited; Delapena & Son Ltd.; Desoutter Bros. Ltd.; Dowding & Doll Limited; Drummond-Asquith (Sales) Limited; Durable Engineering Company.

Elgar Machine Tool Co. Ltd.; B. Elliott & Co. Ltd.

W. A. Fell Limited; Fenter Limited; Firth Brown Tools Limited; W. T. Flather Limited; Fletcher Miller Limited; Flextol Engineering Co. Ltd.; Funditor Limited.

Gear Grinding Co. Ltd.; Grimston Electric Tools Limited; Frank Guylee & Son Ltd.

Hall & Pickles Limited; Hardinge Machine Tools Limited; John Harris Tools Limited; T. S. Harrison & Sons Ltd.; George Hatch Limited; Heenan & Froude Limited; Alfred Herbert Limited; Edward G. Herbert Limited; Hilger & Watts Limited; Holbrook Machine Tool Co. Ltd.; John Holroyd & Co. Ltd; Hordern, Mason & Edwards Limited; Humphris & Sons Ltd.; Herbert Hunt & Sons Ltd.

Incandescent Heat Co. Ltd.; Index Automatic Machine Co. Ltd.

Geo. Jackman Machine Tool Co. Ltd.; A. A. Jones & Shipman Limited; E. H. Jones (Machine Tools) Limited; Sidney G. Jones Limited.

H. W. Kearns & Co. Ltd.; Keighley Grinders (Machine Tools) Limited; Kendall & Gent Limited; Kerry's (Great Britain) Limited; Kitchen & Wade Limited.

John Lang & Sons Ltd.; Lapointe Machine Tool Co. Ltd.; Lincoln Electric Co. Ltd.; Litton's Machine Tool Co. Ltd.; Richard Lloyd Limited; Lorant & Co. Ltd.; Luke & Spencer Limited; Lumsden Machine Co. Ltd.; John Lund Limited.

McFadden & Barron Limited; Machine Shop Equipment Limited; Maiden & Co. Ltd.; Gaston E. Marbaix Limited; B. & S. Massey Limited; Masson Seeley & Co. Ltd.; Thomas Mercer Limited; Metalclad Limited; Midgley & Sutcliffe Limited; Henry Milnes Limited; Minnesota Mining & Manufacturing Co. Ltd.; D. Mitchell & Co. Ltd.; Mitchell's Emery Wheel Co. Ltd.; Modern Machine Tools Limited; Moore Manufacturing Co. Ltd.; L. M. Van Moppes & Sons (Diamond Tools) Ltd.; S. L. Van Moppes Limited; Morrison, Marshall & Hill Limited; Motor Gear & Engineering Co. Ltd.; Murex Limited (Powder Metallurgy Division).

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James Neill & Co. (Sheffield) Ltd.; Newall Engineering Co. Ltd.; Noble & Lund Limited; Norton Grinding Wheel Co. Ltd.

Oliver Machinery Co. Ltd.; Samuel Osborn & Co. Ltd.

J. Parkinson & Son (Shipley) Ltd.; Pearson Phillips Limited; Planers (Huddersfield) Limited; Fred'k Pollard & Co. Ltd.; F. Pratt & Co. Ltd.; Projectile & Engineering Co. Ltd.

Renold & Coventry Chain Co. Ltd.; George Richards & Co. Ltd.; R. J. H. Tool and Equipment Co. Ltd.; Rockwell Machine Tool Co. Ltd.; F. E. Rowland & Co. Ltd.; Rushworth & Company; S. Russell & Sons Ltd.; Thomas Ryder & Son Ltd.; Rye Engineering Works (High Wycombe) Limited.

Sciaky Electric Welding Machines Limited; Arthur Scrivener Limited; Selson Machine Tool Co. Ltd.; A. Shaw & Son (Diamonds) Ltd.; Sheffield Twist Drill & Steel Co. Ltd.; Smart & Brown (Machine Tools) Limited; Snow & Co. Ltd.; Soag Machine Tools Limited; Société Génévoise Limited; Stedall Machine Tool Company; Stein & Atkinson Limited; Leo. C. Steinle Limited; John Stirk & Sons Ltd.; George Swift & Sons Ltd. (incorporating Swift Summerskill Limited); W. E. Sykes Limited.

Taylor, Taylor & Hobson Limited.

Universal Grinding Wheel Co. Ltd.; William Urquhart; Vaughan Associates Limited; Edgar Vaughan & Co. Ltd.; Vickers-Armstrongs Limited.

Wadkin Limited; H. W. Ward & Co. Ltd.; Thos. W. Ward Limited; Ward Haggas & Smith Limited; Weatherley Oilgear Limited; Wickman Limited; Charles Wickstead & Co. (1920) Ltd.; Wild-Barfield Electric Furnaces Limited; Wilkins & Mitchell Limited; Wilson Lathes Limited; and Woodhouse & Mitchell (Props. Thos. W. Ward Limited).

Loans for Brazilian Railway Projects

The World Bank has authorised loans, recommended by the Brazil-United States Commission for Economic Development, for large-scale development in Brazil. The sums involved are U.S. $12,500,000 to the Central Railway to finance imports of repair shop and yard equipment, locomotives, steel wagons and sundry materials, and U.S. $25,000,000 to equip eight power stations in Rio Grande do Sul.

The Bank said that an application for a supplementary loan of U.S. $12,500,000 for the Central Railway was being submitted and would be considered as soon as received. Export-Import Bank loans will finance imports from the U.S.A., but World Bank loans will be used to purchase foreign exchange and pay for imports from other countries.

Application of Loans

Eight projects, involving loans totalling U.S. $59,700,000, have been completed by the Commission and now await decision in Washington. Of the loans applied for, one is to finance imports of material for the Parana-Santa Catarina Railway, see July 11 issue, four are for power station equipment, two for plants to manufacture caustic soda and iron pipes, and one for road-building machinery. Eleven other projects, calling for loans of U.S. $112,950,000, have been agreed by the Commission and are being prepared for submission to Washington. Five are to finance imports of rolling stock and equipment for Réde Mineira de Viaçao, Estrada de Ferro Noroeste, Réde Viaçao Cearense, and for the suburban lines of the Central Railway at Rio.

I.R.C.A. Permanent Commission

Final summaries adopted at the Enlarged Meeting of the Permanent Commission of the International Railway Congress in Stockholm

The fourth meeting of the Enlarged Permanent Commission of the International Railway Congress Association was held in Stockholm on June 9-14, 1952, at the invitation of Mr. E. G. J. Upmark, General Manager of the Swedish State Railways, who presided. Monsieur F. Delory, Director General of the Belgian National Railways, attended as President of the I.R.C.A., supported by Lord Hurcomb, Chairman of the British Transport Commission, and by Monsieur Goursat, Director of the Northern Region of the French National Railways, Vice Presidents, and Monsieur P. Ghilain, of the Belgian National Railways, who is Vice-President and Secretary General of the I.R.C.A.. Mr. Nils Mard, of the Swedish State Railways Publicity Department, was Secretary General of the Local Organisation Committee of the I.R.C.A., responsible for all arrangements made in Sweden.

Of the five Sections of the Congress Association (I: Way & Works, II: Locomotives & Rolling Stock, III: Working, IV: General, and V: Light Railways & Colonial Railways) Sections I, III, and IV were represented at Stockholm.

Level Crossings

Section I met under the chairmanship of Monsieur Robert Lévi, Directeur des Installations Fixes, S.N.C.F. The reporters included (for English-speaking countries) Mr. Gilbert Matthews, Operating Superintendent, British Railways, Western Region, and Mr. S. Williams, Signal & Telecommunications Engineer, London Midland Region. The questions discussed referred to level crossings.

The Section found that the regulations of the Geneva Protocol on indication of the presence of level crossings have been followed by many countries, with good results; it drew attention to the reliability and economy of operation of automatic warning devices, but stressed the disadvantages of these without the physical road traffic barrier of gates, and suggested use of light automatic half-gates. There should be uniformity in the type of and indications given by signals, and whether absolute or permissive stop. Abolition of level-crossing keepers was advocated largely as a matter of manpower economy.

At unmanned crossings without keepers, automatic signals giving warning of trains may be a solution where no further action is possible, such as increasing visibility by cutting back banks.

It was agreed that private crossings were a problem in Britain where road or pedestrian traffic over them had increased because of local developments. Private crossings should not be multiplied.

Door-to-Door Transport

Methods of door-to-door transport, containers, and packing were examined by Section III, of which Mr. A. A. Harrison, Executive Officer (Road Transport), the Railway Executive, was chairman. It was agreed that the private siding still was the most economical means of achieving door-to-door transport.

Apart from private sidings, the container is the cheapest method, but the road-rail trailer and the container "pa," which are more expensive in capital outlay, can be cheaper to run in certain circumstances. The Section found the wagon transporter to be justified only when traffic is regular and substantial and the terminal distance short. Further research is necessary into the costs of door-to-door transport.

Specialisation in types of containers may cause excessive multiplication. Use of "ordinary" or "pa" containers or road-rail trailers would be assisted by establishment of "centre" stations served by main-line goods trains and feeder road services. Where the small type of container is used it was agreed that railway users seemed to prefer containers of one or two cu. m. (35-70 cu. ft.)

Palletisation

On palletisation it was found that "full advantage is taken of pallets only when they are conjointly used by the producer, the stockist, the transporter and the consignee. Their advantage increases according to the number of handlings involved." The parcels grouped into lots corresponding to the capacity of the pallets and the power of the fork-lift trucks should remain if possible loaded on the same pallets throughout the journey.

The most economical method of operation appears to involve the use of standardised pallets from a pool, but it was appreciated that many difficulties exist in the way of establishing such a pool. The ownership of the pallets and the tariffs for empty and loaded runs should be so established that the railway receives a fair payment for the additional loads it carries.

Packing

Railway administrations should campaign for better packing, giving consignors the benefit of their experience and research. As non-returnable packing gives the greatest guarantee of solidity and hygiene, and preserves the good appearance of goods, it is preferable when it can be technically and economically introduced.

Closing and Construction of Lines

Section IV, over which Mr. Upmark presided, discussed *inter alia* the economic aspects of closing existing and constructing new lines "with regard to the possibility of handling transport by other means." The problem was found to be one mainly of rail *versus* road.

It was agreed that "to enable the railways to fulfil, under the most economic conditions, their role as general transport undertakings, they must be empowered, within the general framework of transport legislation, under certain circumstances with a priority right to provide and to operate the most economic form of transport."

In such a transport system, road transport is, in principle, used as a means of regional collection and dispersal from and to concentration points on the most important railway lines. In these circumstances, road transport may be substituted, within the necessary limits, and under the responsibility of the railways, for rail.

Railway-controlled Road Services

"Experience shows," it was found, "that substitution is most easily arranged and administered under a single authority (railway administration). Complementary rail/road service has never been attainable where there is far-reaching competition between separate rail and road undertakings."

For economic reasons, railway administrations must be authorised to close down a railway line or to substitute a road

service for a railway service. If this authorisation is not granted, the railway administrations must receive compensation for the amount of potential saving they are not permitted to realise.

Research has shown that where traffic is less than 250,000 traffic units a year and per km. of line, road traffic is more economical on the basis of retaining railway rates. The experience of some European railway administration shows that withdrawal of passenger services on lines with a mixed traffic and their replacement by road services leads to an increase in the daily mileage operated in comparison with the passenger train service.

The Section agreed that on lines with a mixed traffic "suspension of freight services generally only brings about comparatively limited savings."

New Construction

New lines usually are required for freight transport in previously undeveloped areas, though there may be justification for new urban or suburban lines to cater for spread of a population or growth of a city, or to relieve road or rail services.

According to estimates by various railway administrations, the minimum traffic density justifying the building of a new separate line is 300,000-500,000 traffic units a year and per km. of line. The return on the capital of a new feeder line can be ensured by a lesser level of traffic than that referred to above. Smaller volumes of traffic can be handled more economically by road. To ensure the return on capital of a new line, railway administrations might be freed in certain cases from the obligation to apply uniform rates throughout the system.

The application of a similar policy to lines with a light traffic, it was agreed, might be desirable in those cases where it would make possible the continued operation of these lines.

O.R.E. Meeting

A special meeting of the O.R.E. (Office de recherches et d'essais), of which Mr. F. Q. den Hollander, General Manager of the Netherlands Railways (who was present at Stockholm) is President, was held on June 10; it was attended by representatives of Swedish railway industries.

Delegates to the meeting of the Permanent Commission included, besides those already named:

United Kingdom: Mr. John Benstead, Deputy Chairman, British Transport Commission; Sir Michael Barrington-Ward, Mr. R. A. Riddles, and Mr. J. C. L. Train, Members, Railway Executive; Lt.-Colonel G. R. S. Wilson, Chief Inspecting Officer of Railways, Ministry of Transport;

India: Mr. F. Badhwar, Chairman of the Railway Board, Government of India; Mr. W. G. W. Reid, Railway Adviser to the High Commissioner for India, London;

New Zealand: Mr. Ranald J. Harvey, Consulting Engineer to the Government of New Zealand;

South Africa: Mr. G. J. A. Lindenberg, Advisory Engineer to the High Commissioner for the Union of South Africa in London;

Ireland: Mr. T. C. Courtney, Chairman, Coras Iompair Eireann;

Austria: Dr. Ernst Seidler, General Manager, Federal Railways;

Denmark: Mr. E. Terkelsen, General Manager, State Railways;

Finland: Mr. F. L. Lehtinen, General Manager, State Railways;

France: MM. Charles Boyaux, Assistant Director General, S.N.C.F.; E. Dorges, Membre du Comite de Direction de la C.P. de l'Association, Secretaire General aux Travaux Publics de France;

Italy: Signor G. di Raimondo, Director General, State Railways;

Portugal: Senhor C. G. C. L. Couvreur, Public Works Department;

Spain: Senor J. M. Garcia-Lomas, Director, R.E.N.F.E.;

Switzerland: Dr. H. Gschwind, President, Federal Railways.

The programme included a banquet given to the Swedish authorities by the Permanent Commission, and one in Stockholm City Hall on June 10, given by the Swedish State Railways Administration. A visit was paid by delegates to the steel manufacturing plant of the Swedish Ball Bearing Company at Hofors.

Gas-Turbine for Generating Station

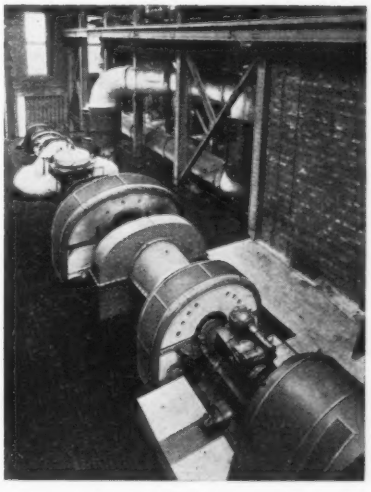
Metrovick plant at Stretford, B.E.A.

A 15,000 kW. gas turbo-generator set was put on load for the first time at the Trafford Power Station, Stretford, near Manchester, on August 6, 1952; it was the first gas turbine-driven generator to go into commission for the British Electricity Authority. The new plant, which was built by the Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester, is installed in an engine room adjoining that housing the steam plant at this station.

The gas-turbine plant operates on an open compound cycle. It consists of a low-pressure compressor, an intercooler, a high-pressure compressor, a heat exchanger, a main combusion chamber, a high-pressure turbine, a reheat combustion chamber, and a low-pressure turbine. The air or gas flows through these compogents in the order named, and the exhaust from the last item passes back through the heat exchanger before its discharge to the chimney stack.

The low-pressure turbine is directly coupled to the low-pressure compressor and to the 15,000 kW. generator; it runs at a constant speed of 3,000 r.p.m. under the control of a speed governor regulating the fuel admission to both combustion chambers. The high-pressure turbine and the high-pressure compressor are coupled together and run at a speed determined by the load conditions, 5,500 r.p.m. at full load.

The combined length of the two units is 80 ft., and, with an intervening space of 16 ft., occupied largely by the reheat chamber, the overall length is 96 ft. The plant is designed for a gas inlet temperature to both turbines of approximately 1,200° F. and an overall pressure ratio of 10 to 1. This gas-turbine plant is largely experimental, and detail modifications may be made in the light of experience.



Gas turbine from low-pressure end

Before the incoming air is admitted to the low-pressure compressor, it is passed through a Precipitron electrostatic filter, which removes solid impurities that might impair the efficiency of the compressor blading.

The stack to which the exhaust gases pass on leavin g the heat exchanger is constructed of reinforced-concrete, and is 250 ft. high.

At first, gas oil will be used as the operating fuel but later it is hoped to modify the plant to use heavier grade oils. On starting, the high-pressure line is rotated by a 400 h.p. a.c. direct-coupled starting motor, and fuel is gradually admitted to the main combustion chamber; the motor is disengaged on reaching a speed of about 3,000 r.p.m. During this time the air drawn through the low-pressure compressor and the gas discharge through the low-pressure turbine slowly rotate the low pressure line, and as fuel is gradually admitted to the reheat chamber the speed of the low pressure line and the generator increases to 3,000 r.p.m. During idle running the high-pressure line runs at about 3,000 r.p.m.

The fuel storage tanks are situated on the remote side of the adjoining canal, and a smaller service tank is accommodated in the foundation of the stack adjoining the engine room. A float-operated switch maintains a suitable level of fuel in the service tank by starting and stopping a motor-driven pump near the storage tank. The fuel system is extremely simple and very flexible from the control point of view; it has been designed for use both on distillates such as gas oil and on pre-heated residual fuels.

A number of interlocks is provided to safeguard against a wrong sequence of starting operations. Thus for barring, the starter motor is interlocked with the auxiliary oil pump and one of the circulating water pumps, so that the starter motor cannot run unless these two pumps are running. For starting, the starter motor is interlocked with the electrostatic air filter, the l.p. line barring motor, one of the main fuel pumps, and one of the circulating water pumps. A further interlock ensures that the reheat chamber cannot be lit before the main chamber.

The a.c. generator is rated at 17,650 kVA., 6·6 kV., three-phase 50 cycles, and is direct-coupled to the gas turbine. It is of standard Metrovick construction with a welded stator frame. The stator winding is of the involute type, and a closed circuit ventilation system is provided with a water-cooled air cooler mounted in the foundation below the machine. Cooling air is re-circulated by means of fans mounted on the ends of the rotor. Excitation is obtained from a main exciter and a pilot exciter, both direct coupled to the main generator shaft. The rotor sliprings are situated one at each end of the rotor.

New Zealand Railways Operating Loss

According to the annual statement of the Railways Department tabled in the House of Representatives, the New Zealand Government Railways were operated at a loss of £1,200,000 in 1951, largely because rising costs had not been absorbed into railway charges in time to offset additional expenditure.

Both gross revenue and expenditure were records at £24,000,000 and £25,200,000 respectively. The high revenue figure was caused mainly by higher charges imposed during the latter part of the year coupled with increased goods tonnage; the record outgoings were due largely to heavy expenditure on imported coal and fuel oil, to wage increases, and to extra provision for track renewals.

Operations during the year were adversely affected by mining disputes creating coal shortages necessitating curtailment of train services. Later, when more coal was available, an acute shortage of train crews enforced a continued reduction in train services, particularly in passenger services which were curtailed to enable essential goods traffic to move. Quantities of goods conveyed continued at a very high level.

At peak periods the demand for rail transport exceeded the ability of the Department to supply it with the available staff and equipment, and a large quantity of goods had to be diverted to the roads.

Progress on Coryton Refinery

About two years ago, work started at Coryton, Essex, on the erection of a refinery for the Vacuum Oil Co. Ltd., where motor spirit, diesel fuel, and lubricating oils will be produced. The project has now reached a stage where its final outline is taking shape. In August, crude oil began to flow into the storage tanks, and early this month, a super-tanker made the first large delivery of crude oil through the new pipeline laid along the enlarged deep-water jetty.

The first major unit to come into action will be the power plant. This will consist of three boilers, which will be linked up with three 5,000-kW. turbo-generators. Besides supplying steam to the generators, the boilers will provide all the process and heating steam.

A two-stage distillation unit has been rising rapidly over the last few months. The distillation tower, in which further splitting up of the crude oil will be carried out *in vacuo*, is so large that it is being built on the site. The complete distillation unit is expected to be in production this autumn.

Catalytic Cracking Plant

An outstanding installation is the thermofor catalytic cracking plant (T.C.C.) Using the air-lift principle to return the regenerated catalyst to the reaction chamber, this will be the first of its kind in the United Kingdom and the second in Europe. It is hoped to bring the T.C.C. into production in less than twelve months.

The lubricating oil units, which will be a main feature of the new refinery, will enable the Vacuum Oil Co. Ltd. to manufacture stock oils for Mobiloil and other well-known lubricants in the United Kingdom for the first time, as well as for lubricants for railways at home and overseas. All four lubricating oil units are expected to be in production by next Spring.

The refinery is rail-served, although the crude oil arrives by sea from the Middle East, and most of the output will be conveyed to Vacuum Oil Company compounding and blending plants at Birkenhead (by specially built tanker) and Wandsworth (by lighter), or locally by road.

Corringham Light Railway

In September, 1950, the Vacuum Oil Company acquired the Coryton (formerly Kynochtown) works site, as that for the new refinery, from Cory Bros. & Co. Ltd., and with it the Corringham Light Railway, which, after rehabilitation, has carried construction materials and plant to the refinery site. The Directors of the Corringham Light Railway are members of the Vacuum Oil Company staff.

The Coryton refinery, which will cost over £12 million in all, has been made possible by Anglo-American co-operation. The Socony-Vacuum Oil Co. Inc., of New York, has provided the technicians to design and supervise the construction. The whole labour force is British, and British industry has provided 95 per cent. of the equipment. Capital has been provided in equal shares by the (British) Powell Duffryn group and the Socony-Vacuum Oil Company.

Staff & Labour Matters

T.U.C. Congress

At the Trades Union Congress at Margate on September 4 delegates approved by a big majority a policy of general wages restraint as recommended by the General Council. The Council statement stresses the serious consequences of substantial wage increases which would raise prices and in turn might price Britain out of world markets. Mr. Lincoln Evans, who introduced the statement, said the unions were not being asked to adopt a policy of wages restraint as applied in 1948-50. The Council's duty was to stress the dangers of the position and then to rely on the good sense of unions.

Railwaymen and Wages Restraint

Mr. J. B. Figgins, General Secretary of the N.U.R., said his union would support an U.S.D.A.W. resolution against attempts to restrict justifiable pay increases, because it conformed with trade union policy.

The N.U.R. had consistently opposed wages restraint and in face of the Railway Executive flat refusal of the claim for a 10 per cent. increase in railwaymen's pay, the railway unions also must continue to oppose restraint.

Mr. N. A Pinches, President of the A.S.L.E.F., defended his union's application for a 10 per cent. rise in pay, but stated that the only alternative to restraint was a "free-for-all on the wages issue" which involved the weakest going to the wall.

C.S.E.U. Claims

Representatives of employers in the shipbuilding industry confirmed, on September 9, the employers' rejection of the C.S.E.U. claim for a substantial pay increase for shipbuilding workers.

The executives of the 38 organisations affiliated to the C.S.E.U. met at York on September 10 to consider the next step in relation to the rejection by the Engineering Employers' Federation of the Confederation claim for a £2 a week increase. Most of the leaders of the C.S.E.U. decided on August 31 to recommend the unions to stop all overtime and piecework in protest, but the executive of the National Union of General & Municipal Workers decided last week in favour of arbitration by the Minister of Labour.

Metrovick Electric Locomotives for Brazil

Shipment from Liverpool of the first two of ten 1,072 *h.p. Bo-Bo locomotives built by Metrovick for the* 3,000 *V. d.c. system of the Parana-Santa Catharina Railway, Brazil. The locomotives weigh* 50 *tonnes*

New Wind Tunnel for British Railways

British Railways are to build a new 100 m.p.h. wind tunnel testing plant at Derby to provide data for the design of locomotives, carriages, wagons, and railway structures. Among the great variety of subjects to be studied will be improved train ventilation; dispersal of smoke and steam; wind resistance of wagons used in high-speed freight trains; design of draught-proof signal lamps; extraction of smoke from engine sheds; and cooling of diesel locomotives.

The tunnel will be housed in a separate building close to the Railway Research Laboratory. It will be operated by an air-screw driven by a 50 h.p. motor which will draw air through at varying speeds up to 100 m.p.h. The tunnel will be of the return flow type which enables use to be made of the unexpended velocity of the air as it returns.

Tests will be carried out with models of such items as trains and buildings where full-scale experiments are impracticable. The new tunnel is expected to be in use by the end of this year.

Contracts & Tenders

The Crown Agents for the Colonies have recently placed a contract with the Metropolitan-Cammell Carriage & Wagon Co. Ltd. for 62 Sheffield-Twinberrow bogies, Burma type. The bogies are for the East African Railways & Harbours, Kenya & Uganda Section.

The High Commissioner for Pakistan is inviting tenders for the supply of various types of wheels and axles. Details are given under Official Notices on page 307.

The Board of Trade, Special Register Information Service, has recently reported that a call for tenders has been issued by the Central Uruguay Railway for the supply of:—

Eight fireboxes for C2, D1, L and N class locomotives

Seven fireboxes for H1, R1, R2, T and W class locomotives

Three fireboxes for D class locomotives

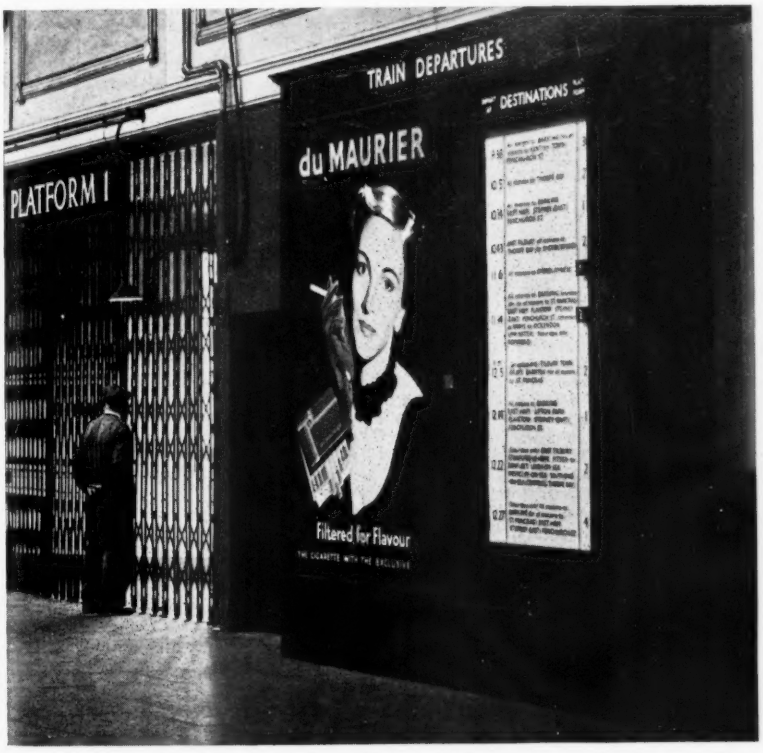
Two fireboxes for R4 and T1 class locomotives

One firebox for N2 class locomotive

Tenders should reach the Office of the Administracion del Ferrocarril Central del Uruguay, Montevideo, by 3 p.m. on Tuesday, October 7. A copy of the tender documents and drawings is available for inspection at the Board of Trade, Commercial Relations & Exports Department, by representatives of United Kingdom manufacturers until September 17; after which date it will be available on loan in order of written application.

UNITED RAILWAYS OF HAVANA: PURCHASE BY CUBAN GOVERNMENT.—The Cuban Government last week published advertisements inviting proposals for the purchase of the United Railways of Havana (see our September 5 issue). Tenders were to be in by September 10, and the official committee concerned is to decide which offer to accept by September 25.

New Train Indicator at Tilbury Riverside, Eastern Region



Display of train departure information at platform entrance in new Benn & Cronin indicator replacing pedestal type in centre of concourse

Notes and News

Vacancies for Civil Engineers.—Vacancies exist for fully qualified civil engineers for service in the Chief Engineer's Department of the Rhodesia Railways. See Official Notices on page 307.

Senior Technical Assistant Required.—Applications are invited for the post of senior technical assistant required for a railway civil engineer's office in London. See Official Notices on Page 307.

Continental Traffic in August Maintained.—Despite the currency restrictions, the number of passengers who crossed to the Continent in August this year by British Railways cross-Channel services compares almost exactly with August, 1951, when over a quarter of a million passengers were carried.

"Europ" Wagon Pool Conference.—Reference was made on page 232 of our issue of August 29, to the recent conference at Neuchâtel, Switzerland, on extending the "Europ" wagon pool agreement. The existing pool, to which the French National and German Federal Railways contributed, was stated to consist of 10,000 wagons; this figure should read 100,000.

Institution of Mechanical Engineers.—Sir David Pye will deliver his Presidential Address, "The Art of the Practical Engineer," to the Institution of Mechanical Engineers, at Storey's Gate, London, S.W.1, on Friday, October 17, at 5.30 p.m. The annual dinner of the Institution will be held at the Dorchester Hotel, Park Lane, W.1, on Thursday, October 16, at 7 for 7.30 p.m.

British Railways Freight Demonstration.—A demonstration of British Railways freight rolling stock and up-to-date loading appliances is to be opened by the Minister of Transport, Mr. A. T. Lennox-Boyd, at Battersea Wharf Goods Depot on Wednesday, September 17. The demonstration will be on show free to the public from 1 p.m. to 6 p.m. on Wednesday and from 10 a.m. to 4 p.m. the following day.

Brighton Works Centenary Special Trains.—The Railway Correspondence & Travel Society has announced that in connection with the special trains being run from Victoria for the Brighton Works Centenary there will be an additional special train over the Kemp Town branch line on Sunday, October 5, for those who do not take part in the full programme. Tickets for this facility, price 3s. should be obtained from Mr. C. G. Woodnut, 15, Cannon Place, Brighton, Sussex. The arrangements were previously referred to in our August 22 issue.

Excessive Taxation: Mr. W. J. Ruston on E.P.L.—The ordinary dividend of 11 per cent., less tax, to be paid by Ruston & Hornsby Limited was stated by Mr. W. J. Ruston, Chairman of the company, in his statement circulated with the report and accounts, to be justified by results. Distributions to equity shareholders, he said, should vary with the fortunes of the business, and were not a permanent standard. The evils of inflation, he added, would not be curbed by seeking out dividends as a subject for attack. Mr. Ruston said that "The iniquitous profits tax is still with us. This particular impost takes 22½ per cent. of distributed profits. This is not a penalty for increasing divi-

dends, but a form of punishment for making any distribution at all." Then there was the new E.P.L. super-imposed on the existing wellnigh intolerable burden of taxation. If the fall in the value of money continued, they might earn alleged excess profits, but not in cash. Inflated inventories and credits to customers would need financing out of such excess profits, and these would be taxed to the tune of at least 80 per cent. Thus a tax designed to take profits out of rearmament would serve to tax inflation which in a very large measure was the direct result of excessive taxation.

Proposal for Royal Commission on Transport.—Saying that a cooling-off period was necessary to help transport recover its commercial commonsense after a surfeit of politics, Professor C. F. Carter told the Economic Section of the British Association on September 9 that he thought it a great pity that various attempts for some kind of independent inquiry had met with no response. Discussing the position of the road haulier, who could often choose traffic and charge low rates because he avoided difficult traffic, Professor Carter said he thought the Government's proposal to make a levy on road transport and pay the proceeds to the British Transport Commission was a step in the right direction.

Alaskan Developments: Effect on White Pass & Yukon Shares.—Excitement was aroused on the Stock Exchange last week over shares of the White Pass & Yukon Railway Corporation Limited. Some weeks ago the common shares were standing at $9¼. Last week they reached over $20, as reported in our railway stock market columns. It is felt that the excitement can hardly have been due to the company's report for the second quarter of the year, which showed a slight fall in net earnings. A suggestion is in circulation that another Canadian corporation is planning to build a plant at Skagway, the Alaskan terminus of the railway, to smelt 200,000 tons of metal a year, using hydro-electric power from the Yukon River, which would bring large traffics to the railway.

Indian Railways Exhibition.—Permits for the import of exhibits for the Indian Railways Centenary Exhibition (see editorial note this week) and other concessions will be granted by the Indian authorities on condition that the exhibits are re-exported within a specified period from the date of import, unless disposal in India is specially authorised. It is understood that exhibits should arrive at the site not later than January 15, 1953. The site will be connected to the main railway line, and trackwork of any gauge required for exhibits will be supplied. Manufacturers who are interested may obtain full details of the exhibition from the Railway Board, Ministry of Railways, New Delhi, India. Other information may be obtained from the Exhibitions & Fairs Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1 (telephone Chancery 4411, ext. 435).

Vacuum Oil Progress and Plans.—The statement by Mr. J. C. Gridley, Chairman of the Vacuum Oil Co. Ltd., circulated with the report and accounts, points out that despite many adverse factors, sales of lubricating oil and grease in 1951 were again a record. Costs of certain raw materials continued to increase, though less steeply than in 1950. These increases, and further substantial rises in freight rates and in packaging and distribution costs, could not be wholly recovered by correspondingly higher selling prices; consequently profits were less than in 1950. Reference is made to the new refinery at Coryton, described elsewhere in this issue, and to the resultant availability of a wide range of products, and to the company's plans for sale, when branded and premium grade petrols return to the British market, of Mobil products.

Euston Improvements Poster.—A new poster issued by the London Midland Region explains pictorially and in two letterpress panels the improvements being carried out at Euston in connection with resignalling and the new signal box. The subject of the poster is a bird's eye view of arrival platforms at the terminus, also showing a small section of the former road overbridge to demonstrate how its removal permits lengthening of platforms and avoidance, by alterations to track layout, of the former difficulties arising when a long train standing at one platform blocked the access to others that were empty, so that incoming trains had to be held up outside the terminus, although there was a platform free to receive them. The poster explains that the complexity of the resignalling work and track alterations make some delays inevitable while work is in progress, but its completion will mean more efficient and expeditious train operation in the future.

Powell Duffryn Report: the Burden of Taxation.—Sir Herbert Merrett, Chairman of Powell Duffryn Limited, emphasises in his statement circulated with the report and accounts the depressing effect of the incidence of current taxation, which if it remains at its present level, must reduce the nation's assets and, therefore, its earnings. He hopes that when the Chancellor of the Exchequer "has made progress in his herculean task of restoring confidence in Britain's ability to pay her way, he will take the courageous step, not only of offering an incentive for enterprise and initiative to those in this country who have the somewhat weary task of running our industry for little or no reward, but of making it possible for public companies to attract new money by the prospect of adequate net return to those who provide it." The Directors recommend payment on September 30, on the £9,660,471 ordinary stock for the year ended March 31, 1952, of a final dividend of 5 per cent., less income tax, making with the interim dividend of 3 per cent. paid on February 23, 8 per cent. for the year.

Institution of Locomotive Engineers.—Subsequent to the reference made in our August 15 issue to the Institution of Locomotive Engineers' Presidential Address to be held on September 24, details of other meetings during the 1952-53 session have become available. Meetings will be held as follows: October 22, "The Development of the Oil Fired Locomotive," by Mr. W. C. Ikeson; November 19, "Stresses in Locomotive Coupling and Connecting Rods," by Dr. H. I. Andrews; December 17, "Recent Development in the Use of Rubber in Railway Engineering," by Mr. S. W. Marsh; January 14, 1953, "Limitations on Train Performance with Electric Traction," by Mr. A. S. Robertson; February 18, "Operating Experience with Two Gas Turbine Locomotives," by Mr. A. W. J. Dymond; March 18, Annual General Meeting, "Locomotive Maintenance," by Mr. R. C. Bond, Vice-President; April 15, "Running Tests of a 500 h.p. Diesel Mechanical Locomotive," by Mr. B. Reed. The Sir Seymour Biscoe Tritton Lecture will be delivered by Mr. F. Q. den Hollander, President, Netherlands Railways; further particulars will be announced later. The Annual Luncheon will be held at the Dorchester Hotel, Park Lane, London, W.1, on Friday, March 6, 1953. In addition, it is hoped to arrange an informal meeting, visits to works and a Summer Meeting.

Record Steel Carryings by British Railways.—The biggest week's forwardings of iron and steel by British Railways for eighteen months is recorded for the week ended August 30, when 219,748 tons were conveyed from the principal steelworks. The tonnage of coal conveyed by rail during the 48 hr. ended 6 a.m. on Monday, September 8—312,840 tons—was the heaviest for over three months.

London Tramway Souvenir.—Queen Mary has accepted from Lord Latham, Chairman of the London Transport Executive, a souvenir album commemorating the tram era in London. The album contains a photograph of Queen Mary when she, with King George V, as Prince and Princess of Wales, attended the inauguration of the London County Council electric tram service in 1903.

Record London-Norwich Timing.—As reported last week, the Eastern Region down "Broadsman" express is to be accelerated to run the 115 miles from London to Norwich in 120 minutes. This is the fastest schedule ever recorded for the London-Norwich journey, and has been made practicable by the use of the standard "Britannia" class Pacific locomotives. The "Broadsman" was introduced in June, 1950.

Level-Crossing Keeper Charged with Manslaughter.—A crossing keeper at Riccall, near York, has been committed for trial at York Assizes on two charges of manslaughter. The charges arose from an accident at Riccall crossing on July 16 which caused the death of two persons when their car was struck by the "Tees-Tyne Pullman." According to the prosecution, about 8 p.m., when the crossing gates and all signals were in favour of the train, the crossing keeper suddenly put the signal at the crossing against the train and opened the gates to road traffic. The express was approaching at about 60-70 m.p.h. and was only about 100 yd. away. A witness said he went to the signalbox with the cricket scores for the crossing keeper, but was there only 30 sec. He was accustomed to giving him the scores, but he did not usually enter the box to do so.

British Standard for Safety Boots and Shoes.—A standard specification, B.S. 1870:1952 (price 2s. 6d.) has been introduced for men's safety boots and shoes for industrial use. A feature of the specification, devised by an expert committee representing safety footwear manufacturers, heavy industries, trade unions, and Government departments, is the incorporation of a toecap of special spring steel of about the same weight as an egg, but able to support a load of 3 tons. This design of footwear is estimated to be able to stop 90 to 95 per cent. of the normal foot accidents in industry and the transport services. At a conference on September 9 introducing the specification, Mr. Harold Watkinson, M.P., Parliamentary Secretary, Ministry of Labour, said that the incidence of foot accidents represented a considerable loss of labour which could ill be

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

THE HIGH COMMISSIONER FOR PAKISTAN invites tenders for the supply of the following:—(1) PRR 3579/52 approximately 1,800 Steel Tyres for Ganz Diesel Rail Cars. (2) SD 3859R/52 approximately 900 Steel Axles for Locomotives. (3) SD 3848R/52 approximately 2,800 Steel Tyres B.G. for Carriages and Wagons. (4) SD 3858R/52 approximately 300 Wheels cast Steel for Locomotives. (5) SD 3861R/52 approximately 100 Axles, Steel, crank with hoops. (6) SD 3877R/52 approximately 300 Wheels and Axles for carriages and wagons.

Forms of tenders, which are returnable by October 14, 1952, may be obtained from the—COMMERCIAL SECRETARY, SUPPLY AND STORES DEPARTMENT, 39, Lowndes Square, London, S.W.1, between the hours of 10 a.m. and 3 p.m. Mondays to Fridays on payment of the sum of 5 (five) shillings for each separate enquiry (not returnable). The references should be quoted on all applications for tender forms. Quotations are to be returned duly completed for each individual enquiry.

RHODESIA RAILWAYS

VACANCIES FOR CIVIL ENGINEERS

VACANCIES exist for fully qualified Civil Engineers for service in the Chief Engineer's Department of the Rhodesia Railways. Preferably single men under the age of 25 years will be considered, but married men not exceeding 30 years of age may apply. A Degree in Civil Engineering and/or Corporate Membership of the Institution of Civil Engineers is essential. The grades of Junior and Assistant Engineer have salary scales between the limits of £560 and £1,460 per annum, with incremental notches of £40 per annum and the commencing salary would be determined in accordance with age and experience. The vacancies are for appointment to the Temporary Staff in the first instance, but transfer to the Permanent Staff may be made to fill vacancies and on the recommendation of the Chief Engineer. Vacancies may occur later on for members of the Permanent Staff for the grade of District Engineer by selection within the scale £1,350 to £1,750 per annum. All salaries are enhanced by a variable Cost of Living Allowance, which at present is 18% on basic rates. Full particulars may be obtained from—THE LONDON AGENT, RHODESIA RAILWAYS, 241, Salisbury House, London Wall, London, E.C.2. Applications should reach the London Agent by September 23, 1952.

NORTH BRITISH LOCOMOTIVE CO., LTD., offer engineering experience to University graduates, and to holders of the Diploma of a Technical College. Students accepted for University or R.T.C. training are also offered practical experience concurrently with academic studies. Further details from—PERSONNEL MANAGER, 110, Flemington Street, Glasgow, N.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10*s.* 6*d.*—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

RAILWAY MAINTENANCE PROBLEMS. By H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth. 8¼ in. by 5¼ in. 82 pp. Diagrams. 5*s.* By post 5*s.* 3*d.* *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25*s.* per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

afforded, apart from the suffering caused. The use of specially-built boots with internal toe-caps had been strongly recommended some years ago, but there had been difficulties in obtaining sheet steel of the necessary strength. These difficulties have now been overcome and the British Standards Institution had meanwhile revised its earlier strength tests in the light of experience gained since they were issued. At the end of the conference a demonstration was given of a London Transport bus running over the foot of the wearer of a safety boot.

Dynamite Explosion in Level Crossing Accident.—A lorry loaded with dynamite struck a shunting engine at a level crossing near Welcom Station, South African Railways, and several persons were killed and injured in the explosion that followed. The station building and houses were damaged, and the shunting engine was blown to pieces. Parts of the engine were found nearly two miles away.

"Towns Line" Centenary Train.—The special train which is being run from King's Cross to York on September 28, as announced in our June 20 issue, to commemorate the opening of the "Towns Line" of the Great Northern Railway, is expected to be hauled by No. 60007, *Sir Nigel Gresley*. The 188 miles are scheduled to be covered in 195 min., including severe slowings at Grantham, Doncaster and Selby.

Photography and Industry.—To assist firms and other organisations interested in industrial photography, the Institute of British Photographers has issued a report on industrial photography indicating the dangers of an uninstructed approach and the gulf between the requirements for a successful personal snapshot and for serious photography. This report is supported by appendices covering the uses of photography, the training and qualifications of photographers, and the planning and equipment of accommodation. Copies of the report, price 5s., are obtainable from the Institute at 49, Gordon Square, London, W.C.1.

Conference on Ash and Clinker in Industry.—Dr. A. C. Dunningham, Chairman of the Organising Committee of the forthcoming Special Study of Ash and Clinker in Industry arranged by the Institute of Fuel, has outlined the purposes of the conference. He points out that ash has always adversely affected combustion processes using solid mineral fuels, but it has caused new difficulties as industrial techniques have been extended in the direction of larger boiler units and higher temperatures and pressures. Moreover, there is a tendency towards the production and marketing of coals having a higher ash content than formerly. During recent years much research has been directed towards the elimination or mitigation of the consequent problems, and very considerable progress has been made. A review of the position as a whole would therefore appear to be opportune. The conference will be held at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, on October 28 and 29.

Lectures on Railway Subjects.—A programme of lectures has been arranged in connection with the exhibition of railway books, prints, and relics at the National Book League, 7, Albemarle Street, London, W. 1. The dates, subjects, and lecturers are as follow:—

September 16: "Travel to the Continent," by Mr. C. Grasemann, formerly Chief Public Relations & Advertising Officer, Southern Region.

September 23: "Locomotives and their Design." By Mr. R. E. Pennoyer.

September 30: "The Railway in Fiction." By Mr. C. Hamilton Ellis.

October 7: "Early Railway Personalities." By Mr. G. Royde Smith, formerly Secretary, L.M.S.R.

October 14: "Railway Archives." By Mr. L. C. Johnson, Architect to the British Transport Commission.

Goods Vehicles Inquiry.—The Minister of Transport, Mr. Alan Lennox-Boyd, is to conduct a sample investigation into the use being made of road goods vehicles. Some 7,000—8,000 vehicles will be picked at random, in their various unladen weight groups, from records kept by the licensing authorities; they include vehicles operated by or on behalf of the British Transport Commission. Operators of vehicles will be required to notify the Ministry of Transport of the movements of each vehicle during the seven days beginning September 22, and to show the nature of the goods carried, the maximum load carried during a journey, mileage run, amount of fuel used, and starting points and destinations. Since a similar investigation was made in 1948, many thousands of additional vehicles have been brought into use and fuel rationing has been abolished. The information is needed primarily for the international study of road transport in connection with the work of the Economic Commission for Europe and the Transport & Communications Commission of the United Nations. Both the Road Haulage Association and the Traders Road Transport Association are asking their members to co-operate in the inquiry.

Night Mail Trains Restored in Malaya.—Running of the Singapore—Kuala Lumpur night mails was resumed on September 1 after the trains had been suspended for some 20 months because of lack of patronage.

Nyasaland Railways Limited: Annual Meeting.—Mr. W. M. Codrington, Chairman & Managing Director of Nyasaland Railways Limited, presided at the annual meeting on September 4, when the report and accounts were adopted. The Chairman's statement circulated with the report and accounts was summarised in our issue of August 29.

Big Entry for L.M.R. Football Competition.—Among the 38 entries for the British Railways (London Midland Region) football challenge cup competition are five teams which have not before appeared in the competition. The London Midland challenge cup, which will be held by the winning team for one year, was presented by the Directors of the former L.M.S.R., and, apart from the war years, has been competed for annually ever since. The newcomers are Springs Branch (Wigan), Northwich, St. Helens, and Mansfield motive power depots, and Derby St. Mary's Goods Department. Last year's winners, Newton Heath, have entered again.

Promotion Campaign for 1953 B.I.F.—A world-wide promotion campaign is being launched to attract buyers to the 1953 Coronation Year British Industries Fair, to be held in London and Birmingham from April 27 to May 8. Steps in the campaign to be initiated during September include initial press advertising in Australia and New Zealand; issue of the first batch of letters in the overseas direct mail campaign, which will go to buyers in the Eastern countries and in South America; and approaches to exhibitors for information to be used in the Fair's service of product news to buyers. Special advertising plans are in preparation for the United States and Canada, where the services of

local agents with experience of marketing in the dollar area will again be utilised. As the campaign gains momentum there will be individual advertising in the press of the Commonwealth and of Europe. Supporting publicity measures will include distribution abroad of 400,000 descriptive booklets in nine languages; 70,000 posters, and 40,000 showcards. A total of 8,000,000 colour sticker stamps will be used to draw attention to the fair on official and commercial correspondence. Arrangements are also in hand for the G.P.O. to frank some 300,000,000 outgoing letters from Britain with the dates of the fair.

Engineering Experience for Graduates and Students.—The North British Locomotive Co. Ltd. offers engineering experience to university graduates, holders of the diploma of a technical college, and students accepted for university or R.T.C. training. See Official Notices on page 307.

Canadian Locomotive Company Dividend Passed.—The Directors of the Canadian Locomotive Co. Ltd. have decided to omit payment of a dividend which would have been payable on September 1. This is the third time the quarterly dividend has been passed this year, the June 1 and March 1 dividends also having been omitted. The company paid four quarterly dividends of 50 cents a share in 1951, making $2 for the year. An announcement states that the September dividend will not be paid because of heavy expenditures incurred for rehabilitation of the plants and the desirability of conserving working capital for inventory requirements.

Withdrawal of W.R. Train Services.—On and from Monday, September 15, the Western Region passenger train services between Bromyard and Leominster (Herefordshire), and between Pencader and Newcastle Emlyn (Carmarthenshire) will be withdrawn. The Leominster to Bromyard Railway, which is 13 miles long, was opened in two sections—Leominster to Steens Bridge in 1884 and Steens Bridge to Bromyard in 1897. With the withdrawal of the service, stations and halts at Rowden Mill, Fencote, Steens Bridge, and Stoke Prior will be closed and passengers will be conveyed by road services operated by the Birmingham & Midland Motor Omnibus Co. Ltd. The Pencader to Newcastle Emlyn line is part of the former Carmarthen & Cardigan Railway and was completed and opened in 1895. On the withdrawal of services from this 10¼-mile line, stations and halts at Llandyssul, Pentrecourt, Henllan, and Newcastle Emlyn will be closed. Road services are operated in this area by the Western Welsh Omnibus Co. Ltd.

Forthcoming Meetings

September 12 (*Fri.*).—Railway Club, 57, Fetter Lane, E.C.4, at 7 p.m. "Three Ways to Hastings," by Mr. H. A. Vallance.

September 13 (*Sat.*).—Railway Students' Association. River Thames Cruise—London Docks, leaving Tower Bridge at 2.30 p.m.

September 17 (*Wed.*) to October 4 (*Sat.*)—International Machine Tool Exhibition, at Olympia, London, W.14.

September 20 (*Sat.*).—Permanent Way Institution, Leeds Section. Visit to underground works at Rothwell Colliery, at 9 a.m.

Railway Stock Market

General conditions in stock markets have shown no material change, though most sections have been inclined to strengthen further under the lead of British Funds, despite the restricted volume of business in evidence. British Funds were helped by Mr. Churchill's encouraging references to the gold and dollar position and outlook, and leading industrial shares improved in sympathy, though there were few outstanding feaures, and buying was notably selective. Many companies are regarded as offering good prospects of maintaining dividends even allowing for the fact that profits generally are now below those of a year ago. Last year dividends were in many instances very moderate in relation to earnings, and there would apparently have to be a heavy fall in profits to necessitate a cut in future dividends.

The profits of a wide range of engineering companies are probably showing an upward trend, and it is doubtless true that engineering shares are relatively undervalued, although because of E.P.L., the scope for higher dividends is very limited. Moreover it seems that in due course steel supplies will improve, and engineering companies will be able to increase earnings from export trade.

Foreign railway stocks, though fairly active, have shown mixed movements and no decided trend. United of Havana stocks recorded moderate fluctuations with the 5 per cent. (1906) debentures back to 16¼ after the rise to 18 after the news that the Cuban Government is offering bids for the railway.

White Pass & Yukon were again the main feature on further strong speculative buying which has carried the price of the common shares up to $19¼ at the time of going to press (after being over $20) while the 5 per cent. convertible debentures rose to 72 and the 4½ per cent. debentures were 29½. The rise which followed the reaction in price of the common shares after the disappointing quarterly earnings, has been accompanied by optimistic talk in the market of prospects for big expansion in earnings as time proceeds if rumoured developments in Alaska materialise.

Antofagasta ordinary eased to 12¾, but the preference stock attracted buyers around 56. San Paulo 10s. units showed steadiness at 11s. and Brazil Rail bonds kept at 6¼.

There was again much activity in Manila Railway securities, but prices came back sharply on fears that an early settlement in respect of the big interest arrears on the holding of Manila Railroad bonds seems improbable. The "A" debentures receded to 81, and the "B" debentures to 73, while the preference shares eased to 9s. 6d. and the ordinary shares changed hands around 2s. 9d.

Dorada Railway ordinary stock strengthened to 56 and the 6 per cent. debentures were 98½. Guayaquil & Quito 5 per cent. debentures were 30½, while International of Central America 5 per cent. gold bonds changed hands around 146. Chilean Northern 5 per cent. debentures marked 30½.

A certain amount of speculative buying of old Russian railway bonds was again in evidence with buyers about around 5s. though sellers were not able to obtain more than 1s. 3d.

Taltal Railway shares were again steady at 15s. with Nitrate Rails 19s.

Canadian Pacifics eased to 64 dollars, while the 4 per cent. preference stock was 65 and the 4 per cent. debentures 80.

A firmer tendency prevailed in the engineering and kindred sections, with Guest Keen up to 55s. 9d., Vickers 46s. 4½d., Cammell Laird 11s. 7½d., and Tube Investments improved to 58s. 3d. T. W. Ward were 71s. 6d., Babcock & Wilcox rallied to 71s., Clarke Chapman were 54s. 6d. and British Aluminum firmed up to 44s. 6d. John Brown have been steady at 45s. 6d. on the good impression created by the results published recently.

Ruston & Hornsby were 38s. 6d. and Renold & Coventry Chain 41s. 6d. Powell Duffryn at 33s. 4½d. responded further to the past year's results.

Movements in the shares of locomotive builders and engineers were around the same levels as a week ago. Beyer Peacock were 28s. 3d.; but at Glasgow, Hurst Nelson improved to 49s. 6d. and North British Locomotive to 15s. 6d.; and at Birmingham, Birmingham Carriage were 32s. 9d. Vulcan Foundry were 23s. 3d., Gloucester Wagon 10s. shares 12s. 6d., Wagon Repairs 5s. shares 12s. 3d. and Charles Roberts 5s. shares 21s. 10½d.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week, or month ended	Traffics for week: This year	Traffics for week: Inc. or dec. compared with 1950/51	No. of week	Aggregate traffics to date: Total 1951/52	Aggregate traffics to date: Increase or decrease
South & Cen. America	Antofagasta ...	800	29.8.52	£ 140,450	+ £2,690	35	£ 5,281,940	+ £ 1,133,070
	Costa Rica ...	281	July, 1952	cl,463,149	+ cl90,299	4	cl,463,149	+ cl90,299
	Dorada	70	July, 1952	35,813	— 1,898	30	235,527	— 15,944
	Inter. Ctl. Amer....	794	June, 1952	$1,009,607	— $23,367	26	$6,944,168	+ $12,517
	Paraguay Cent. ...	274	29.8.52	G582,639	+ G218,540	8	G4,018,613	+ G1,354,628
	Peru Corp. ...	1,050	Aug., 1952	$9,656,000	+ $997,000	9	$19,162,000	+ $2,578,000
	,, (Bolivian Section)	66	Aug., 1952	Bs.15,591,000	+ Bs.1,629,000	9	Bs.31,978,000	+ Bs.4,987,000
	Salvador	100	May, 1952	cl53,000	+ c15,000	48	cl,899,000	+ c32,000
	Taltal	122	July, 1952	$2,260,000	+ $470,000	4	$2,260,000	+ $470,000
Canada	Canadian National†	23,473	July, 1952	18,575,000	+ 893,333	30	128,910,000	+ 11,476,000
	Canadian Pacific†...	17,037	July, 1952	13,064,000	+ 1,132,000	30	87,106,000	+ 6,182,000
Various	Barsi Light* ...	167	July, 1952	44,155	— 11,670	17	124,140	— 29,610
	Gold Coast ...	536	July, 1952	260,241	+ 5,354	17	1,179,541	+ 119,405
	Mid. of W.Australia	277	June, 1952	52,966	+ 9,338	52	690,910	+ 193,202
	South Africa ...	13,398	16.8.52	1,973,780	+ 75,344	20	39,005,131	+ 1,644,282
	Victoria	4,744	Apr., 1952	2,010,674	+ 217,273	43	—	—

* Receipts are calculated at 1s. 6d. to the rupee † Calculated at $3 to £1